

South Texas Sustainability Bibliography

(Peer-reviewed articles 1990-2012)

Climate

A Public Health Perspective on Sea-Level Rise: Starting Points for Climate Change Adaptation.....	11
Mangrove expansion in the Gulf of Mexico with climate change: Implications for wetland health and resistance to rising sea levels	11
Review: Threats to sandy beach ecosystems: A review	12
Prospects for interregional correlations using Wisconsin and Holocene aridity episodes, northern Gulf of Mexico coastal plain.....	13
Modeling mechanisms of vegetation change due to fire in a semi-arid ecosystem.....	14
Short-term streamflow forecasting with global climate change implications - A comparative study between genetic programming and neural network models.....	15
Policy stakeholders and deployment of wind power in the sub-national context: A comparison of four U.S. states.....	15
Influence of climate change on avian migrants' first arrival dates.....	16
The structure of ecological state transitions: Amplification, synchronization, and constraints in responses to environmental change.....	17
Regional news portrayals of global warming and climate change.....	17
Modeling the impacts of climate policy on the deployment of carbon dioxide capture and geologic storage across electric power regions in the United States.....	18
Water and soil resources response to rising levels of atmospheric CO2 concentration and to changes in precipitation and air temperature.....	19
Amino acids in grassland soils: Climatic effects on concentrations and chirality.....	20
Risk and damage of southern pine beetle outbreaks under global climate change.....	20

Energy

A new formation-evaluation technique for the lower tertiary in south Texas - Predicting production in low-permeability, fine-grained sandstones.....	21
Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation.....	22

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Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation: Discussion.....	22
Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation: Reply.....	23
Plains E&P to acquire more Eagle Ford assets in South Texas.....	23
Vapor-recovery unit passes South Texas field test.....	24
Potential salinity-driven free convection in a shale-rich sedimentary basin: Example from the Gulf of Mexico basin in south Texas.....	24
High-temp. MWD, LWD tools help South Texas wells.....	25
Shell drills world's first MonoDiameter well in South Texas.....	25
Further growth lies ahead for South Texas Wilcox plays.....	25
Underbalanced drilling with casing in South Texas.....	26
Effects of diagenesis on enhanced-resolution bulk density logs in tertiary gulf coast sandstones: An example from the lower Vicksburg Formation, McAllen Ranch field, south Texas.....	26
Oil and Gas Developments in South Texas in 1989.....	27
Environmental solutions - key successful South Texas line installation.....	27
Radiogenic heat production in sedimentary rocks of the Gulf of Mexico basin, south Texas.....	28
Sedimentary Features of the South Texas Continental-slope as revealed by side-scan sonar and high- resolution seismic data.....	28
Exploring for Subtle Traps with High-Resolution Paleogeographic Maps: Reklaw 1 Interval (Eocene), South Texas: Discussion.....	29
Mapping sediment-dispersal patterns and associated systems tracts in fourth- and fifth-order sequences using seismic sedimentology: Example from Corpus Christi Bay, Texas.....	29
Technology tackles low-permeability sand in South Texas.....	30
Exploring for Subtle Traps with High-Resolution Paleogeographic Maps: Reklaw 1 Interval (Eocene), South Texas: Reply.....	31
Regional Variations in Formation Water Chemistry – Major and minor elements; Frio Formation Fluids; Texas.....	31
New Pipeline Coating System Speeds South Texas Rehab.....	31

* means full text is available on request. **Record** means not specific to South Texas but useful. ©means the abstract is protected by the publisher’s copyright, and users may only print, download, or email for individual use.

TransTexas hikes gas flow in South Texas.....	32
Fluvial Sedimentology and Architecture of The Middle Frio Formation (Oligocene), Jim-Wells, Kleberg, and Nueces Counties, South Texas.....	32
Reservoir Petroleum Geochemistry of Sarita (South Texas), Eugene Island 330 and South Marsh Island 128 (Offshore Louisiana) Oil-Fields	32
Short-time-scale (year) variations of petroleum fluids from the U.S. Gulf Coast.....	33
Review: The role of constructed reefs in non-indigenous species introductions and range expansions...34	
Diagenesis of Sandstones at Shale Contacts and Diagenetic Heterogeneity, Frio Formation, Texas.....	34
Relationships between cement, rock fabric, porosity and permeability, lower Vicksburg formation, mcallen ranch field, South Texas.....	35
Exploitation of Oil in a Volcanic Cone by Horizontal Drilling in The Elaine Field, South Texas.....	35
Sequence Stratigraphy and Sedimentology of a Shelf-Margin Lowstand Wedge in The Deep Wilcox Flexure Trend of South-Texas.....	35
The Exploration Potential of The Downdip Yegua in South Texas.....	36
Diagenetic Variability in Middle Frio Formation Gas-Reservoirs (Oligocene), Seeligson and Stratton Fields, South Texas.....	36
Recognition and Implications of Volcanic Glass Detritus in The Fluvial Deposits of The Middle Frio Formation, South Texas.....	36
Depositional-Environments and Reservoir Compartmentalization Within The Frio Zone 21-B Reservoir, Tijerina-Canales-Blucher Field, South Texas.....	36
Horizontal Exploitation of The Upper Cretaceous Austin Chalk of South Texas.....	37
Buda Strikes May Boost South Texas Action.....	37
Miocene chronostratigraphy, paleogeography, and play framework of the Bur os Basin, southern Gulf of Mexico.....	37
Heat flow and thermal history of the Anadarko basin, Oklahoma.....	38
Nuclear new build in the United States 1990–2010: A three state analysis.....	38
Power Supplier Giles for 2 New Reactors.....	39
Nuclear Fallout.....	39

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South Texas Project - STP converts from 'ponderous bus' to 'sleek sports car'.....	39
South Texas Project - From 'watch list' to 'world class' performance in five years.....	40
The Nuclear Energy Market and The Nonproliferation Regime.....	40
Evaluating Methodologies: A Procedure and Application to Nuclear Power Plant Siting Methodologies.....	40
The Current “Nuclear Renaissance” in The United States, Its Underlying Reasons, and Its Potential Pitfalls	41
Nuclear Power Prospects in The USA: The Continuing Problem of The Waste Issue.....	41
Major structural elements of the Miocene section, Burgos Basin, northeastern Mexico.....	42
All eyes on Texas.....	42
A Thematic Analysis of Local Respondents’ perceptions of Barnett Shale Energy Development.....	43
Bob West field: Extending upper Wilcox production in South Texas.....	43
Pioneer speeds up South Texas Edwards reef gas play.....	44
Recipe for a Tex-Mex Pipeline Project: Considerations in Permitting a Cross-Border Gas Transportation Project.....	44
Characterization of the sedimentary thermal regime along the Corsair growth-fault zone, Texas continental shelf, using corrected bottomhole temperatures.....	44
Conoco buys south Texas Lobo trend assets.....	45
Weedy lignocellulosic feedstock and microbial metabolic engineering: advancing the generation of 'Biofuel'	45
Evaluating the Impacts of Real-Time Pricing on the Cost and Value of Wind Generation.....	45
Economics of compressed air energy storage to integrate wind power: A case study in ERCOT.....	46
Speciation of Uranium in a South Texas Lignite – Additional Evidence for a Mixed-Mode of Occurrence.....	46
Geothermal power production from abandoned oil wells.....	47
Thermal conductivity of Wilcox and Frio sandstones in south Texas (Gulf of Mexico basin).....	47
South Texas baffled by leaks.....	48
Unconventional Energy Resources: 2011 Review.....	48

* means full text is available on request. **Record** means not specific to South Texas but useful. ©means the abstract is protected by the publisher’s copyright, and users may only print, download, or email for individual use.

A comparison of offshore wind power development in Europe and the U.S.: Patterns and drivers of development.....	49
A unit commitment study of the application of energy storage toward the integration of renewable generation.....	49
Fuel for Thought 19.1 (mid-August to mid-November 2008).....	50
Energy sources, public policy, and public preferences: Analysis of US national and site-specific data.....	50
Fuel for Thought Facts and Wishful Thinking Climate Politics and Policy – Bali General Energy Issues and Carbon Fuels Emission Policy Transport and Carbon Finance Technology and INNOVATION Climate Science Debated IPCC Critique and Uses Nuclear.....	51
Mexico's Gas Import Tariff: Roadblock to Investments and Recovery.....	51
Attitudes Toward Energy Conservation: A Confirmatory Factor Analysis.....	51
An Applied Local Sustainable Energy Model: The Case of Austin, Texas.....	52
Petrography and geochemistry of the San Miguel lignite, Jackson Group (Eocene), south Texas.....	52
Soil microbial respiration as a tool to assess post mine reclamation.....	53
Concepts and methods of ecological engineering.....	54

Water

The History of W.A. East V. Houston and Texas Central Railway Company, 1904: Establishment of The Rule of Capture in Texas Water law or “He Who Has The Biggest Pump Gets The Water”	54
A literature based study of stormwater harvesting as a new water resource.....	55
Movement and Microhabitat Associations of Guadalupe Bass in Two Texas Rivers.....	55
Influence of Vessel Passages on Tidal Creek Hydrodynamics at Aransas National Wildlife Refuge (Texas, United States): Implications on Materials Exchange.....	56
Hydrologic Footprint Residence: Environmentally Friendly Criteria for Best Management Practices.....	56
Hispanic Farmers and Ranchers in the Soil and Water Conservation Movement in South Texas, 1940s to Present.....	57
Barriers to Water Conservation in the RIO Grande Basin.....	57
The challenge of documenting water quality benefits of conservation practices: a review of USDA-ARS's conservation effects assessment project watershed studies.....	58

* means full text is available on request. **Record** means not specific to South Texas but useful. ©means the abstract is protected by the publisher’s copyright, and users may only print, download, or email for individual use.

Developing Objective Operational Definitions for Monitoring Drought.....	59
Is Denser Greener? An Evaluation of Higher Density Development as an Urban Stormwater-Quality Best Management Practice.....	59
Groundwater Supply in Texas: Private Land Considerations in a Rule-of-Capture State.....	60
Tracking U.S. Groundwater.....	60
A review of residential water conservation tool performance and influences on implementation effectiveness.....	60
Water Resources: Agricultural and Environmental Issues.....	61
Residential Water Use.....	61
To Play the Fool: Can Environmental Conservation and Democracy Survive Social Capital?.....	62
Selecting Agricultural Best Management Practices for Water Conservation and Quality Improvements Using Atanassov's Intuitionistic Fuzzy Sets.....	62
Water Conservation and Management.....	63
Re-thinking water scarcity: Can science and technology solve the global water crisis?.....	63
Conservation Integral to a Sustainable Water Supply.....	63
Bi-national water issues in the Rio Grande/Río Bravo basin.....	64
Defending Corpus Christi.....	64
Using EPIC model to manage irrigated cotton and maize.....	65
Corn yield responses under crop evapotranspiration-based irrigation management.....	65
Household Adoption of Water-Efficient Equipment: The Role of Socio-Economic Factors, Environmental Attitudes and Policy.....	66
Forage potential of Opuntia clones maintained by the USDA, national plant germplasm system (NPGS) collection.....	66
A framework for regional association rule mining and scoping in spatial datasets.....	67
Bayesian analysis of groundwater quality in a semi-arid coastal county of south Texas.....	68
Constructed wetlands as recirculation filters in large-scale shrimp aquaculture.....	68
Onion Yield and Quality Response to Two Irrigation Scheduling Strategies.....	69

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Responsible Care: Strategies for Pollution Prevention and Environment Management in E & P Sector of Petroleum Industry.....	70
Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico from Streams in the South-Central United States.....	70
The applications of GIS in the analysis of the impacts of human activities on south Texas watersheds..	71
Experimental Evidence for Microbially Mediated Carbonate Dissolution from the Saline Water Zone of the Edwards Aquifer, Central Texas.....	72
Exposure Elements in Oil Spill Risk and Natural Resource Damage Assessments: A Review.....	72
The Geographic Distribution of Population Health and Contaminant Body Burden in Gulf of Mexico Oysters.....	72
Organochlorines and trace elements in four colonial waterbird species nesting in the lower Laguna Madre, Texas.....	73
Arsenic, Nitrate, Chloride and Bromide Contamination in The Gulf Coast Aquifer, South-Central Texas, USA.....	74
A simplified approach for monitoring hydrophobic organic contaminants associated with suspended sediment: methodology and applications.....	74
Characterization and Degradation of Petroleum Hydrocarbons Following an Oil Spill into a Coastal Environment of South Texas, U.S.A.	75
The applications of GIS in the analysis of the impacts of human activities on south Texas watersheds...	76
Using swat to Model Streamflow in Two River Basins With Ground and Satellite Precipitation Data.....	76
Do Texas groundwater conservation districts matter?	77
Comparison of Configurations for High-Recovery Inland Desalination Systems.....	78
Design Space Characterization for Meeting Cost and Carbon Reduction Goals Smart Irrigation Controllers in the Southwestern United States.....	78
Fluoride levels in Texas groundwater.....	79
The Changing Geography of the U.S. Water Budget: Twentieth-Century Patterns and Twenty-First-Century Projections.....	79
Condensate Harvesting from Large Dedicated Outside Air-Handling Units with Heat Recovery.....	80
The Nexus of Energy and Water in The United States.....	80

* means full text is available on request. **Record** means not specific to South Texas but useful. ©means the abstract is protected by the publisher’s copyright, and users may only print, download, or email for individual use.

Urban Water Demand with Periodic Error Correction.....	81
A Horizontal Federalism Solution to the Management of Interstate Aquifers: Considering an Interstate Compact for the High Plains Aquifer.....	81
Future U.S. Water Consumption: The Role of Energy Production.....	81
Responsible Care: Strategies for Pollution Prevention and Environment Management in E & P Sector of Petroleum Industry.....	82
Residential Water Use.....	82
Water Consumption in the Production of Ethanol and Petroleum Gasoline.....	83
Consumptive water use to feed humanity -- curing a blind spot.....	83
Water: A critical resource in the thermoelectric power industry.....	84

Environment

Lady Bird Johnson Wildflower Center: Implications for Sustainable Development on Water Sensitive Sites.....	85
Sustainable pattern analysis of a publicly owned material recovery facility in a fast-growing urban setting under uncertainty.....	85
Optimal design for sustainable development of a material recovery facility in a fast-growing urban setting.....	86
The Value of "Green:" Evidence from the First Mandatory Residential Green Building Program.....	86
Green Building Programs -- Are They Really Green?.....	87
Grassroots Start to Grow.....	87
Technology and Place: Sustainable Architecture and the Blueprint Farm.....	87
Maintain to Sustain.....	88
Green Architecture and the Holistic Montessori School.....	88
Review of Some Recent Developments in Sustainable Shrimp Farming Practices in Texas, Arizona, and Florida.....	89
Conventionalization, Bifurcation, and Quality of Life: Certified and Non-certified Organic Farmers in Texas.....	89

* means full text is available on request. **Record** means not specific to South Texas but useful. © means the abstract is protected by the publisher's copyright, and users may only print, download, or email for individual use.

Combination of multispectral remote sensing, variable rate technology and environmental modeling for citrus pest management.....	90
Sustainability of agroecosystems in semi-arid grasslands; simulated management of woody vegetation n the Rio Grande Plains of southern Texas and northeastern Mexico.....	90
Sustaining agriculture in drought years.....	91
Modeling Potential Coastal Vegetation Response to Sea Level Rise and Storm Surge on Estuarine Peninsulas.....	91
Atascosa Germplasm Texas Grama.....	92
Catarina Blend Bristlegrass.....	92
Webb Germplasm Whiplash Pappusgrass.....	93
Short-term Response of Herpetofauna to Various Burning Regimes in The South Texas Plains.....	93
Reduced genetic diversity and isolation of remnant ocelot populations occupying a severely fragmented landscape in southern Texas.....	93
Habitat Partitioning Bysympatric Ocelots and Bobcatas: Implications for Recovery of Ocelots in Southern Texas.....	94
A comparison of coyote ecology after 25 years: 1978 versus 2003.....	95
Fifty-Five Years of Fish Kills in Coastal Texas.....	95
Conservation biogeography of the US-Mexico border: a transcontinental risk assessment of barriers to animal dispersal.....	96
Home Range and Landscape Use of Coyotes in A Metropolitan Landscape: Conflict or Coexistence?....	96
Germination and early growth traits of 14 plant species native to northern Mexico.....	97
Reflectance characteristics and remote sensing of a riparian zone in south Texas.....	97
Seasonal variation in herpetofauna abundance and diversity in the south Texas plains.....	98

Sustainability education

Positive Energy: Green-Jobs Training Prepares Students for New Careers.....	99
Examining the Impacts of a Graduate Course on Sustainable Development Using Ecological Footprint Analysis.....	99
Undergraduate Agriculture Curricula in Sustainability: An Evaluation Across Borders.....	100

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Putting Green to Work on Your Campus.....100

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Record 1***Subject: climate change – public health****Title: A Public Health Perspective on Sea-Level Rise: Starting Points for Climate Change Adaptation**

Authors: Craig, Robin Kundis

Source: Widener Law Review; 2010, Vol. 15 Issue 2, p521-540, 20p

Subject Terms: Sea level; environmental aspects; global temperature changes—environmental aspects; water levels; global warming—social aspects; climate change mitigation; environmental protection; health risk assessment; environmental health; social aspects

Abstract: One of the widely acknowledged consequences of global climate change is sea-level rise. Sea-level rise has predictable impacts on human welfare and the environment and the oceans will continue to rise for some time, regardless of the climate change mitigation measures that the countries of the world decide to take. Therefore, some adjustment to sea-level rise—adaptation—is inevitable. However, sea-level rise poses two challenges for leaders trying to formulate adaptation plans. First, sea-level rise is slow, measured in millimeters per year, and the full extent of climate change-driven sea-level rise is expected to take centuries to manifest. This is a planning horizon outside the political ken of most governmental bodies; indeed, planning horizons longer than a few decades are extremely rare. Second, scientists are still uncertain as to the extent of the problem. Specifically, how high will the oceans rise? For both reasons, adaptation to sea-level rise requires some form of adaptive management—an ability to react to new information regarding the extent and speed of sea-level rise as that information becomes more certain and precise for different areas of the country. Moreover, an adaptive management approach to sea-level rise provides a means of avoiding government inaction because of uncertainty. Instead, recognition of the need for an adaptive approach necessarily counsels governments to implement initial adaptation measures that will be beneficial to coastal communities regardless of how far the oceans encroach and how fast they do so. This Article suggests that taking a public health approach to sea-level rise can provide governments and planners with immediately implementable and "no regrets" adaptation measures that will be beneficial to coastal communities regardless of the eventual actual impacts of sea-level rise in particular areas of the country. Specifically, this Article suggests that planners should begin by looking at three specific concerns: (1) availability of drinking water supplies; (2) potential changes in disease exposure, with resultant changes in medical infrastructure and training needs; and (3) the potential for the toxic contamination of sea water as it comes ashore, with resultant changes in allowable land uses in the coastal zone.©

Record 2**Subject: climate change – wetland****Title: Mangrove expansion in the Gulf of Mexico with climate change: Implications for wetland health and resistance to rising sea levels**

Authors: Rebecca S. Comeaux; Mead A. Allison; Thomas S. Bianchi c

Source: Estuarine, Coastal and Shelf Science 96:81-95

Subject Terms: mangrove swamps; wetlands; coastal erosion; climate change; sea level

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Abstract: Black mangroves (*Avicennia* spp.) are hypothesized to expand their latitudinal range with global climate change in the 21st century, induced by a reduction in the frequency and severity of coastal freezes, which are known to limit mangrove colony extent and individual tree size. The Gulf of Mexico is a prime candidate for population expansion to occur because it is located at the northward limit of black mangrove habitat. This may come at the expense of existing coastal saline wetlands that are dominantly *Spartina* spp. marsh grasses. The present study was conducted to focus on the implications of a marsh to mangrove transition in Gulf wetlands, specifically: (1) wetland resistance to accelerating eustatic sea level rise (ESLR) rates; (2) resistance to wave attack in large storms (increased cyclonic storm frequency/intensity is predicted with future climate warming); and (3) organic carbon sequestration and wetland soil geochemistry. Field sites of adjacent and inter-grown *Avicennia germinans* mangrove and *Spartina* marsh populations in similar geomorphological setting were selected in back-barrier areas near Port Aransas and Galveston, TX. Elevation surveys in the more mature Port Aransas site indicate mangrove vegetated areas are 4 cm higher in elevation than surrounding marsh on an average regional scale, and 1–2 cm higher at the individual mangrove scale. ²¹⁰Pb and ¹³⁷Cs accumulation rates and loss on ignition data indicate that mineral trapping is 4.1 times higher and sediment organics are 1.7 times lower in mangroves at Port Aransas. This additional mineral trapping does not differ in grain size character from marsh accumulation. Elevation change may also be effected by soil displacement of higher root volumes in mangrove cores. Port Aransas porosities are lower in mangrove rooted horizons, with a corresponding increase in sediment strength, suggesting mangrove intervals are more resistant to wave-induced erosion during storm events. Port Aransas mangroves exhibit higher pore water redox potentials and salinities over entire core depths and depressed pH over rooted intervals, suggesting a distinct diagenetic environment exists relative to marsh sites. The rooting network, which introduces oxygen into the sediment and focuses evapo-transpiration and salt exclusion within this zone, may prove advantageous when competing with grasses by elevating salinities to levels that are toxic for *Spartina*. Trends observed in the more mature systems of Port Aransas are generally absent in Galveston, suggesting the youth and physically shorter stature of these systems means they have not yet established a unique sediment signature.

Record 3*

Subject: climate change – sandy shores

Title: Review: Threats to sandy beach ecosystems: A review

Authors: Omar Defeo; Anton McLachlan; David S. Schoeman; Thomas A. Schlacher; Jenifer Dugan; Alan Jones; Mariano Lastra; Felicita Scapini

Source: Widener Law Review; 2010, Vol. 15 Issue 2, p521-540, 20p

Subject Terms: sandy shores; threats; climate change; human impacts; global change

Abstract: We provide a brief synopsis of the unique physical and ecological attributes of sandy beach ecosystems and review the main anthropogenic pressures acting on the world's single largest type of open shoreline. Threats to beaches arise from a range of stressors which span a spectrum of impact scales from localised effects (e.g. trampling) to a truly global reach (e.g. sea-level rise). These pressures act at multiple temporal and spatial scales, translating into ecological impacts that are manifested

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across several dimensions in time and space so that today almost every beach on every coastline is threatened by human activities. Press disturbances (whatever the impact source involved) are becoming increasingly common, operating on time scales of years to decades. However, long-term data sets that describe either the natural dynamics of beach systems or the human impacts on beaches are scarce and fragmentary. A top priority is to implement long-term field experiments and monitoring programmes that quantify the dynamics of key ecological attributes on sandy beaches. Because of the inertia associated with global climate change and human population growth, no realistic management scenario will alleviate these threats in the short term. The immediate priority is to avoid further development of coastal areas likely to be directly impacted by retreating shorelines. There is also scope for improvement in experimental design to better distinguish natural variability from anthropogenic impacts. Sea-level rise and other effects of global warming are expected to intensify other anthropogenic pressures, and could cause unprecedented ecological impacts. The definition of the relevant scales of analysis, which will vary according to the magnitude of the impact and the organisational level under analysis, and the recognition of a physical–biological coupling at different scales, should be included in approaches to quantify impacts. Zoning strategies and marine reserves, which have not been widely implemented in sandy beaches, could be a key tool for biodiversity conservation and should also facilitate spillover effects into adjacent beach habitats. Setback and zoning strategies need to be enforced through legislation, and all relevant stakeholders should be included in the design, implementation and institutionalisation of these initiatives. New perspectives for rational management of sandy beaches require paradigm shifts, by including not only basic ecosystem principles, but also incentives for effective governance and sharing of management roles between government and local stakeholders.

Record 4*

Subject: climate change – Gulf of Mexico

Title: Prospects for interregional correlations using Wisconsin and Holocene aridity episodes, northern Gulf of Mexico coastal plain

Authors: Ervin G Otvos

Source: Quaternary Research 61(1):105-118

Subject Terms: Late Quaternary; climate change; eolian sedimentation cycles; coastal dunes; prairie mounds

Abstract: Luminescence dating of extensive dune fields and associated eolian sandsheets provided a chronology of recently recognized Pleistocene and early Holocene dry climate episodes in the currently humid warm temperate northern–northeastern Gulf of Mexico region. Scattered parabolic dunes and clusters of intersecting parabolic dunes, along with elongated shore-transverse and shore-parallel dunes, developed. These landforms occur in a 390-km-long and 2- to 3-km-wide, semicontinuous belt in southeast Alabama and northwestern Florida. Dune elevations reach ± 22 m. Sangamon coastal barrier sectors were the primary source of the eolian sand. Deflation was coeval with early Wisconsin to mid-Holocene marine low sea-levels and associated distant shorelines. Early Holocene dune dates were synchronous, with indications of a hypsithermal dry interval in southeast Louisiana, the Yucatan, and the

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south Atlantic seaboard. Overlapping with dry episodes in Yucatan and the High Plains, Texas dunes and Louisiana and Texas prairie mounds, especially in the southwest Texas coast still dominated by dry climate, suggests intervals of early to late Holocene drought. The dates provide the basis for identifying and correlating Wisconsin, early, and late Holocene climate phases between currently semiarid and humid, coastal and interior areas. They contribute to future studies, including interregional paleoclimate modeling. Although Pleistocene coastal eolian deposition coincided with glaciation in the northern interior and with cooler temperatures of a reduced Gulf of Mexico, Holocene aridity phases may have been related to major variations in the position of high-pressure cells, storm tracks, and branches of the jet stream, and even to prolonged La Niña conditions.

Record 5*

Subject: climate change – ecosystem

Title: Modeling mechanisms of vegetation change due to fire in a semi-arid ecosystem

Authors: Joseph D. White; Kevin J. Gutzwiller; Wylie C. Barrow; Lori Johnson Randall; Pamela Swint.

Source: Ecological Modelling 214(2):181-200

Subject Terms: Physiological processes; shrub encroachment; modeling; fire; semi-arid; disturbance; climate change; Big Bend National Park; sem-land model

Abstract: Vegetation growth and community composition in semi-arid environments is determined by water availability and carbon assimilation mechanisms specific to different plant types. Disturbance also impacts vegetation productivity and composition dependent on area affected, intensity, and frequency factors. In this study, a new spatially explicit ecosystem model is presented for the purpose of simulating vegetation cover type changes associated with fire disturbance in the northern Chihuahuan Desert region. The model is called the Landscape and Fire Simulator (LAFS) and represents physiological activity of six functional plant types incorporating site climate, fire, and seed dispersal routines for individual grid cells. We applied this model for Big Bend National Park, Texas, by assessing the impact of wildfire on the trajectory of vegetation communities over time. The model was initialized and calibrated based on landcover maps derived from Landsat-5 Thematic Mapper data acquired in 1986 and 1999 coupled with plant biomass measurements collected in the field during 2000. Initial vegetation cover change analysis from satellite data showed shrub encroachment during this time period that was captured in the simulated results. A synthetic 50-year climate record was derived from historical meteorological data to assess system response based on initial landcover conditions. This simulation showed that shrublands increased to the detriment of grass and yucca-ocotillo vegetation cover types indicating an ecosystem-level trajectory for shrub encroachment. Our analysis of simulated fires also showed that fires significantly reduced site biomass components including leaf area, stem, and seed biomass in this semi-arid ecosystem. In contrast to other landscape simulation models, this new model incorporates detailed physiological responses of functional plant types that will allow us to simulate the impact of increased atmospheric CO₂ occurring with climate change coupled with fire disturbance. Simulations generated from this model are expected to be the subject of subsequent studies on landscape

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dynamics with specific regard to prediction of wildlife distributions associated with fire management and climate change.

Record 6

Subject: climate change – streamflow

Title: Short-term streamflow forecasting with global climate change implications - A comparative study between genetic programming and neural network models

Authors: Makkeasorn, A; Chang, NB; Zhou, X

Source: JOURNAL OF HYDROLOGY; MAY 15, 2008, 352 3-4, p336-p354, 19p.

Subject Terms: streamflow forecasting; genetic programming; neural network; global climate change; NEXRAD; sea surface temperature

Abstract: Vegetation growth and community composition in semi-arid environments is determined by water availability and carbon assimilation mechanisms specific to different plant types. Disturbance also impacts vegetation productivity and composition dependent on area affected, intensity, and frequency factors. In this study, a new spatially explicit ecosystem model is presented for the purpose of simulating vegetation cover type changes associated with fire disturbance in the northern Chihuahuan Desert region. The model is called the Landscape and Fire Simulator (LAFS) and represents physiological activity of six functional plant types incorporating site climate, fire, and seed dispersal routines for individual grid cells. We applied this model for Big Bend National Park, Texas, by assessing the impact of wildfire on the trajectory of vegetation communities over time. The model was initialized and calibrated based on landcover maps derived from Landsat-5 Thematic Mapper data acquired in 1986 and 1999 coupled with plant biomass measurements collected in the field during 2000. Initial vegetation cover change analysis from satellite data showed shrub encroachment during this time period that was captured in the simulated results. A synthetic 50-year climate record was derived from historical meteorological data to assess system response based on initial landcover conditions. This simulation showed that shrublands increased to the detriment of grass and yucca-ocotillo vegetation cover types indicating an ecosystem-level trajectory for shrub encroachment. Our analysis of simulated fires also showed that fires significantly reduced site biomass components including leaf area, stem, and seed biomass in this semi-arid ecosystem. In contrast to other landscape simulation models, this new model incorporates detailed physiological responses of functional plant types that will allow us to simulate the impact of increased atmospheric CO₂ occurring with climate change coupled with fire disturbance. Simulations generated from this model are expected to be the subject of subsequent studies on landscape dynamics with specific regard to prediction of wildlife distributions associated with fire management and climate change.

Record 7*

Subject: climate change – wind power

Title: Policy stakeholders and deployment of wind power in the sub-national context: A comparison of four U.S. states

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Authors: Fischlein, Miriam; Larson, Joel; Hall, Damon M.; Chaudhry, Rumika; Rai Peterson, Tarla; Stephens, Jennie C.; Wilson, Elizabeth J.

Source: Energy Policy; Aug2010, Vol. 38 Issue 8, p4429-4439, 11p

Subject Terms: **Wind power; climate change mitigation; climate changes -- law & legislation; energy policy; comparative studies; economic aspects; public administration; U.S. states**

Abstract: As climate change mitigation gains attention in the United States, low-carbon energy technologies such as wind power encounter both opportunities and barriers en route to deployment. This paper provides a state-level context for examining wind power deployment and presents research on how policy stakeholders perceive wind energy in four states: Massachusetts, Minnesota, Montana, and Texas. Through semi-structured interviews, state-level energy policy stakeholders were asked to explain their perceptions of wind energy technology within their state. Interview texts were coded to assess how various drivers promote or hinder the deployment of wind power in sub-national contexts. Responses were dominated by technical, political, and economic frames in all four states, but were often driven by a very different rationale. Environmental, aesthetic, and health/safety frames appeared less often in the discourse. This analysis demonstrates that each state arrived at its current level of deployment via very different political, economic, and technical paths. In addition to helping explain why and how wind technology was – or was not – deployed in each of these states, these findings provide insight into the diversity of sub-national dialogues on deployment of low-carbon energy technologies.

Record 8*

Subject: climate change – migrant behavior

Title: **Influence of climate change on avian migrants' first arrival dates.**

Authors: DeLeon, Robert L.; Deleon, Emma E.; Rising, Gerald R.

Source: The Condor, Vol 113(4), Nov, 2011. pp. 915-923.

Subject Terms: **climate change, avian migrant arrival dates**

Abstract: Long-term studies over a variety of regions, species, and time periods can help link trends in climate to changes in bird phenology and provide better understanding of potential effects of climate change. We analyzed first spring arrival dates of 93 species of migrants from the Buffalo Ornithological Society's database covering the period from 1967 to 2008. Migrants appeared a mean 0.10 days earlier each year. Short-range migrants, traveling from a winter range within North America, have advanced their average arrival more, 0.15 days per year, than have long-range migrants from Central America, South America, or the West Indies, whose advance averaged 0.06 days per year We regressed arrival dates against the temperature of short-range migrants' winter range, as represented by Houston, Texas, and the North American Oscillation Index as indicators of climate change. The Houston temperature correlates well with earlier arrival dates, especially for short-range migrants. We compared our results with similar studies across North America and found general agreement with the trends we observed. These results are consistent with the hypothesis that climate change has a strong influence on the phenology of bird migration.©

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Record 9***Subject: climate change – ecological response****Title: The structure of ecological state transitions: Amplification, synchronization, and constraints in responses to environmental change**

Authors: Jonathan D. Phillips

Source: Special Section: Complexity of Coupled Human and Natural Systems, Ecological Complexity 8(4):336-346

Subject Terms: State-and-transition models; spectral radius; algebraic connectivity; S-metric; ecological response; climate change; synchronization

Abstract: Effects of environmental change may be either amplified and facilitated, or constrained, by the network of state-changes in ecological systems. Network structure affects system response independently of the dynamics of the individual subsystems. Ecological responses were represented as state-and-transition models (STMs), and analyzed as mathematical graphs. Three metrics were applied that reflect: (1) the extent to which environmental change is amplified or filtered by state transitions; (2) network synchronizability and the rate of propagation of state changes; and (3) the extent of system structural constraints to the spatial propagation of state transitions. These were determined for seven archetypal graph structures representing common forms of connectivity in ecological networks, and linked to distinct modes of ecological change. Radiation-type structures are the least synchronized and most constrained patterns, with the most limited amplification, followed by other low-connectivity patterns such as those associated with monotonic succession. The maximum-connectivity rigid polygon structure (any state can transition to any other) has the strongest amplification and synchronization and least constraints. Structural constraints to change propagation are most sensitive to increasing numbers of transitions for a given number of states, and synchronization also increases at least linearly with the number of links. Amplification, however, does not increase as rapidly; as long as a graph is connected, increasing the number of links does not proportionally increase it. Because the more densely connected structures have much higher synchronization than other patterns, and fewer constraints on change propagation, environments characterized by these types of STMs may be prone to rapid, complex transitions in response to environmental changes. STMs for rangelands in two regions of Texas show that the rigid polygon structure is very common. If this phenomenon is more general, it suggests that relatively abrupt landscape reorganizations may be more likely than more orderly successions of change along environmental gradients. This analysis shows that identification of STMs and their network structure is useful for recognizing environments at higher risk for complex reorganization, and for identification of management actions to either retard or facilitate propagation of state changes.

Record 10***Subject: climate change – global warming****Title: Regional news portrayals of global warming and climate change**

Authors: Xinsheng Liu; Arnold Vedlitz; Letitia Alston

Source: Environmental Science and Policy 11(5):379-393

Subject Terms: Climate change; global warming; issue salience and attributes; use of science; Regional news media

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Abstract: In this study we utilize content analysis techniques to examine how the issue of global warming and climate change has been characterized during the period of 1992 through 2005 by the Houston Chronicle—the largest regional newspaper in the Texas coastal region. A total of 795 global warming and climate change news articles from the Houston Chronicle are collected, coded and analyzed. Data analyses are organized and presented with regard to issue salience, various issue attributes (issue image, scope, linkage, participant, proposed solution and responsible party), use of science, and scientific information sources cited in the news stories. We find that regional media attention to the global climate change issue generally increases over time and an overwhelming majority of the news articles view the issue as a harmful problem. However, given the scientific consensus that global warming will result in significant devastating climate change consequences to the coastal regions, there are still a fair number of news articles delivering mixed, undetermined or even non-harmful messages. We also find that climate change is often discussed as a national or international-global issue, and frequently linked to a number of other public issues rather than just being viewed as an environmental–ecological problem. Moreover, we find that emphasis on issue solutions is placed more on mitigation strategies than on adaptation behaviors, and that both governmental and non-governmental actions and responsibilities are suggested for dealing with climate change. In addition, our findings indicate that the regional newspaper in Texas obtains scientific information on climate change primarily from academic institutions. Implications of our findings and recommendations for future research are discussed in the concluding section.

Record 11

Subject: climate change – electric power

Title: **Modeling the impacts of climate policy on the deployment of carbon dioxide capture and geologic storage across electric power regions in the United States**

Authors: Marshall Wise; James Dooley; Robert Dahowski; Casie Davidson

Source: 8th International Conference on Greenhouse Gas Control Technologies, International Journal of Greenhouse Gas Control 1(2):261-270

Subject Terms: **Carbon dioxide capture and geologic storage; electric power; climate change**

Abstract: This paper summarizes the results of a first-of-its-kind holistic, integrated economic analysis of the potential role of carbon dioxide (CO₂) capture and storage (CCS) technologies across the regional segments of the United States (U.S.) electric power sector, over the time frame 2005–2045, in response to two hypothetical emissions control policies analyzed against two potential energy supply futures that include updated and substantially higher projected prices for natural gas. This paper's detailed analysis is made possible by combining two specialized models developed at Battelle: the Battelle CO₂-GIS to determine the regional capacity and cost of CO₂ transport and geologic storage; and the Battelle Carbon Management Electricity Model, an electric system optimal capacity expansion and dispatch model, to examine the investment and operation of electric power technologies with CCS against the background of other options. A key feature of this paper's analysis is an attempt to explicitly model the inherent heterogeneities that exist in both the nation's current and future electricity generation infrastructure and in its candidate deep geologic CO₂ storage formations. Overall, between 180 and 580 gigawatts (GW) of coal-fired integrated gasification combined cycle with CCS (IGCC+CCS) capacity is built by 2045

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in these four scenarios, requiring between 12 and 41 gigatonnes of CO₂ (GtCO₂) storage in regional deep geologic reservoirs across the U.S. Nearly all of this CO₂ is from new IGCC+CCS systems, which start to deploy after 2025. Relatively little IGCC+CCS capacity is built before that time, primarily under unique niche opportunities. For the most part, CO₂ emissions prices will likely need to be sustained at over \$20/tonneCO₂ before CCS begins to deploy on a large scale within the electric power sector. Within these broad national trends, a highly nuanced picture of CCS deployment across the U.S. emerges. Across the four scenarios studied here, power plant builders and operators within some North American Electric Reliability Council (NERC) regions do not employ any CCS while other regions build more than 100GW of CCS-enabled generation capacity. One region sees as much as 50% of its geologic CO₂ storage reservoirs' total theoretical capacity consumed by 2045, while most of the regions still have more than 90% of their potential storage capacity available to meet storage needs in the second half of the century and beyond. A detailed presentation of the results for power plant builds and operation in two key regions: ECAR in the Midwest and ERCOT in Texas, provides further insight into the diverse set of economic decisions that generate the national and aggregate regional results.

Record 12*

Subject: climate change – hydrologic modeling

Title: **Water and soil resources response to rising levels of atmospheric CO₂ concentration and to changes in precipitation and air temperature**

Authors: V. Chaplot

Source: Journal of Hydrology 337(1):159-171

Subject Terms: **Climate change; CO₂; hydrologic modeling; water; soil; NO₃-N loads**

Abstract: The quantification of the diverse responses of soils and terrestrial fresh water to elevated levels of greenhouse gases and to climate change is crucial for the proper management of natural ecosystems in the future. Despite previous experiments and simulations, there is still a need for the evaluation of the impact of these global changes at the watershed level. The main objective of this paper is to examine the effects of increasing CO₂ concentrations and rainfall changes associated with changes in average daily rainfall intensity, and surface air temperature on loads of water, NO₃-N and sediments from watersheds exhibiting different environmental conditions. The interactively coupled (CO₂-climate-landuse) Soil and Water Assessment Tool (SWAT) was used to predict the effect of variations in precipitation and rainfall intensity (a 10%, 20% and 40% increase or decrease) or surface air temperature (an increase of 0.5 and 3.5°C in the mean winter temperature) associated with an increase of CO₂ concentration from 330 to 950ppm in two agricultural watersheds in Iowa and Texas. Over a 100-year simulated period: (1) precipitation changes primarily affected flow and sediment discharges while temperature and changes in atmospheric CO₂ concentration had a smaller effect; (2) CO₂ concentration was the main controlling factor of NO₃-N loads; and (3) global changes in the humid watershed had a greater effect on the water and soil resources than in the semi-arid. In particular, increasing precipitations in the humid watershed significantly increased the median and interquartile of outputs of all the variables under consideration. In contrast, changes in surface air temperature had only a slight impact on loads. However higher temperatures in the more humid site tended to

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reduce the highest loads. These results demonstrate that changes in CO₂ concentration and climate, particularly an increase in precipitation, had significant effects on the soil and fresh water resources. The magnitude of these effects differed according to the watershed's characteristics. Finally, the general applicability of these results and the limits of the approach are discussed.

Record 13*

Subject: climate change – soil

Title: Amino acids in grassland soils: Climatic effects on concentrations and chirality
Authors: W. Amelung; X. Zhang; K.W. Flach
Source: Geoderma 130(3):207-217
Subject Terms: Climate change; soil N cycle; grassland soils; microbial residues; racemization; amino acid enantiomers
Abstract: The response of soil organic nitrogen (SON) dynamics to climate may partly be deduced from changes in the concentration and origin of the major N constituents in soil, such as amino acids. In this study, we determined the enantiomers of bound amino acids in 18 native grassland soils (0–10 cm) that were sampled along a transect from central Saskatchewan, Canada, to Southern Texas, USA. Mean annual temperature (MAT) ranged from 0.9 to 23.4 °C and mean annual precipitation (MAP) from 300 to 1308 mm. d-alanine and d-glutamic acid served as markers for the bacterial origin of SON. The d-content of lysine, phenylalanine, and aspartic acid indicated an ageing of the respective SON forms. Deuterium labeling was applied to account for hydrolysis-induced racemization reactions. We found that the concentration of the bacterial biomarkers was weakly but significantly parabolically related to MAT, as previously reported for microbial-derived amino sugars. The age markers d-lysine, d-phenylalanine, and d-aspartic acid comprised 2–15% of the respective l-form. The presence of these compounds demonstrated that the structures that contained these d-enantiomers had survived microbial attack, i.e., these hydrolyzable SON forms were conserved in soil despite a living environment. First estimates indicate that the mean residence time of the lysine-containing organic matter forms extend beyond a century. Within this time-scale we did not find that climate significantly affects the degree of ageing of SON constituents in the studied topsoils.

Record 14*

Subject: climate change – pine beetle

Title: Risk and damage of southern pine beetle outbreaks under global climate change
Authors: Jianbang Gan
Source: Forest Ecology and Management 191(1):61-71
Subject Terms: Southern pine beetle; infestation risk; climate change; panel data
Abstract: This study, using the panel data modeling approach, investigates the relationships between climatic variables and southern pine beetle (SPB) (*Dendroctonus frontalis* Zimmermann) infestations and assesses the impact of global climate change on SPB infestation risk and damage. The panel data model alleviates possible collinearity among climatic variables, accounts for the effect of omitted or unobserved variables, and incorporates natural and human adaptation, thus representing a more robust approach to analyzing climate change impacts. SPB outbreaks in Louisiana and Texas

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appeared to move together; infestations in Alabama, Arkansas, Georgia, Florida, Mississippi, South Carolina, North Carolina, and Tennessee were highly correlated; and Virginia demonstrated its unique temporal pattern of SPB outbreaks. Salvage harvest was found to be helpful in lessening future infestation risk. Warmer winters and springs would positively contribute to SPB outbreaks with spring temperature showing a more severe and persistent impact than winter temperature; increases in fall temperature would ease SPB outbreaks; and summer temperature would have a mixed impact on SPB infestations. Compared to temperature, precipitation would have a much smaller impact on SPB infestations. While increases in the previous winter, spring, and fall precipitation would enhance SPB outbreak risk in the current year, a wetter summer would reduce infestations 3 years later. Global climate change induced by doubling atmospheric CO₂ concentration would intensify SPB infestation risk by 2.5–5 times. If the changes in the area and productivity of southern pine forests due to climate change are accounted for, SPB would cause even more severe damage, 4–7.5 times higher than the current value of trees killed annually.

Record 15

Subject: energy – petroleum

Title: A new formation-evaluation technique for the lower tertiary in south Texas - Predicting production in low-permeability, fine-grained sandstones

Authors: Rasmus, JC; Horkowitz, JP; Chabernaud, T; Graham, P; Summers, M; Wise, D

Source: SPE RESERVOIR EVALUATION & ENGINEERING; FEB, 2006, 9 1, p24-p31, 8p.

Subject Terms: Energy & fuels; engineering, petroleum; geology

Abstract: The lower Tertiary Wilcox, Yegua, and Vicksburg formations are prolific natural gas plays in south Texas that have been extensively drilled and produced from low-permeability, fine-grained sandstones. It is not unusual to encounter several potential pay zones in each well. What is lacking is a proven formation-evaluation method to determine the highest-productivity water-free producing zones from multiple intervals that can be casually identified oil the logs as hydrocarbon-bearing. Connate-water resistivity (R_w) determination is not a major problem, given that many water-bearing sands are usually present. Accurately estimating true clay content, porosity, irreducible water volumes, and permeability present the greatest challenges. A new spectroscopy-based petrophysical interpretation methodology has been developed that makes use of several unique measurements, namely quantitative elemental concentrations and lithology logs obtained from capture gamma ray spectroscopy devices in open or cased wells. These measurements allow us to more accurately define the clay content, mineralogy, and matrix properties of each potential zone. One significant finding obtained from these measurements is the occurrence of calcite cements detected in many sands that cause a pessimistic density porosity to be computed if not accounted for. This calcite cementation appears to vary dramatically in a lateral sense, indicating that its presence should not be used to condemn an entire layer as being too tight for production, nor provide irrefutable evidence of the expected ability of the layer to contain a hydraulic fracture. The enhanced elemental and mineralogical analyses provided by the spectroscopy measurements also allow for more accurate bulk volume irreducible water calculations and a means to correct the neutron porosity for clay and matrix effects.

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By comparing irreducible water volume to bulk volume hydrocarbon, an accurate prediction of water production can be determined. Oil- and gas-bearing intervals can be identified easily from crossover of the matrix-corrected neutron porosity when used in conjunction with the matrix-corrected density porosity. Results are illustrated with several case studies from wells recently drilled and now producing from the Wilcox, Yegua, and Vicksburg formations.

Record 16*

Subject: energy – petroleum

Title: Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation

Authors: Brown, LF; Loucks, RG; Trevino, RH; Hammes, U

Source: AAPG BULLETIN; NOV, 2004, 88 11, p1501-p1522, 22p.

Subject Terms: Energy & fuels; basin; engineering; geosciences

Abstract: A detailed analysis of Oligocene Frio Formation intraslope, growth-faulted subbasins in the Corpus Christi, Texas, area indicates that deposition during relative lowstands of sea level was the main initiator, or trigger, of growth faulting. Lowstand depocenters on the low-gradient, upper continental slope comprising basin-floor fan facies, slope-fan systems, and prograding lowstand delta systems exerted sufficient gravity stress to trigger major sections of outer shelf and upper slope strata to fail and move basinward. The faults sole out deep in the basin, and rotation of hanging-wall blocks mobilized deep-water muds and forced the mud basinward and upward to form mud (shale) ridges that constitute the basinward flank of intraslope subbasins overlying footwall fault blocks. Sedimentation associated with third-order relative falls of sea level produced load stress that triggered a major regional syndepositional growth-fault system. Subbasins on the downthrown side of each arcuate fault segment that constitute a regional fault system are filled during the lowstands of sea level. Consequently, genetically similar but noncontemporaneous lowstand depositional systems filled each successive growth-faulted subbasin trend. The subbasin stratigraphy becomes younger basinward because the subbasin development and fill process extended the Frio shelf edge stepwise into the Oligocene Gulf of Mexico Basin, coinciding with relative third-order sea level cycles. The subbasins have been prolific petroleum targets for decades and are now the focus of prospecting for deep gas. Lowstand sandstones are principal reservoirs, and syndepositional tectonics produced anticlinal and fault traps and associated stratigraphic pinch-out traps on the flanks of the structures. Understanding the origin of the faulted subbasins and their chronostratigraphic relationships and depositional processes provides a perspective that can improve deep gas exploration..

Record 17

Subject: energy – petroleum

Title: Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation: Discussion

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Authors: Edwards, MB
Source: AAPG BULLETIN; MAY, 2006, 90 5, p787-p798, 12p.
Subject Terms: Energy & fuel; Gulf-of-Mexico; systems tract; deposition; evolution; framework; basin
Abstract: This is a discussion of a multi-author "sequence stratigraphic" study of growth-faulted Frio Formation of South Texas. This discussion describes fundamental shortcomings in their observations and interpretations, specifically 1.Deep-water Frio facies are farther downdip and deeper than predicted by Brown et al. (2004); 2.Their model ignores the tenfold magnitude difference between the gradients of growth faults and clinoforms; 3.The comparatively thicker section on the downthrown block reflects greater subsidence rates associated with focused structural extension and not the development of steeply dipping fault scarps at the shelf margin; 4.Multiple methods of correlating well logs in growth-faulted regions are essential, including those disparaged as "traditional" by Brown et al. (2004), particularly in a "sequence-stratigraphic" framework; 5.Their sequence-stratigraphic model makes no reference to the past 15 yr of work on progradational components (i.e., highstand, lowstand prograding wedge, forced regressive wedge, and falling stage systems tracts); this especially hampers the stratigraphic interpretation of the progradational facies that dominate these growth-faulted zones.

Record 18*

Subject: energy – petroleum

Title: Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation: Reply

Authors: Brown, LF; Loucks, RG; Trevino, RH; Hammes, U
Source: AAPG BULLETIN; MAY, 2006, 90 5, p799-p805, 7p.
Subject Terms: Energy & fuels; offshore,; miocene;

Abstract: Reply to the discussion which was brought out by Edwards, MB in his article: Understanding growth-faulted, intraslope subbasins by applying sequence-stratigraphic principles: Examples from the south Texas Oligocene Frio Formation: Discussion.

Record 19*

Subject: energy – petroleum

Title: Plains E&P to acquire more Eagle Ford assets in South Texas

Authors:
Source: OIL & GAS JOURNAL; OCT 18, 2010, 108 39, p27-p27, 1p.
Subject Terms: Energy & fuels; engineering; petroleum

Abstract: Editorial material

Record 20*

Subject: energy – petroleum

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Title: Vapor-recovery unit passes South Texas field test

Authors: Kirchgessner, DA; Masemore, SS; Chatterton, WA; Richards, RG

Source: OIL & GAS JOURNAL; APR 14, 2003, 101 15, p60-p65, 6p.

Subject Terms: Energy & fuels; engineering; petroleum

Abstract: Performance testing of a vapor-recovery unit developed by Comm Engineering USA has shown the technology capable of collecting 64 MMscf/year of vent gases with a value of about \$350,000. In this application, such a return produces a payback period of about 4 months. Testing of the Environmental Vapor Recovery Unit took place at a TotalFinaElf SA exploration and production facility in South Texas by the US Environmental Protection Agency's Office of Research and Development as part of its Environmental Technology Verification program to facilitate deployment of new technologies through voluntary performance verification and information dissemination. The unit was estimated to have an availability of 99.9% for the purpose of these calculations. The VRU that had been in operation previously was estimated to have an availability of 90%. Had this particular facility been uncontrolled before installation of the test unit, the gas savings would amount to almost 64 MMscf/year. Compared to the VRU that was in place, the savings would be about 6.4 MMscf/year.

Record 21

Subject: energy – petroleum

Title: Potential salinity-driven free convection in a shale-rich sedimentary basin: Example from the Gulf of Mexico basin in south Texas

Authors: Sharp, JM; Fenstemaker, TR; Simmons, CT; McKenna, TE; Dickinson, JK

Source: AAPG BULLETIN; DEC, 2001, 85 12, p2089-p2110, 22p.

Subject Terms: Energy & fuels; petroleum; free thermohaline convection; frio formation; disposal basin; sandstones

Abstract: We investigate the plausibility of salinity-driven free (thermohaline) convection in sedimentary rocks of the south Texas part of the Gulf of Mexico basin using salinity data, Rayleigh number calculations, and numerical models. Previous studies speculated that free convection could account for high fluxes evidently required for diagenesis in the basin, but low-permeability shales are calculated to be a barrier to free convection. In the study area, salinity inversions occur either above or within the transition zone from hydro-pressures to overpressures. The positioning of brines over less saline fluids provides a significant buoyancy force. Rayleigh number calculations and numerical simulations suggest that homogeneous shaly systems are unstable near the high end of the expected ranges of shale permeability (10^{-15} - 10^{-16} m²). Numerical simulations show that the influx of brine into the permeable layers and permeability heterogeneity in the shales are both conducive to free convection. Simulations indicate that salinity-driven free convection can occur at lower permeabilities (10^{-16} - 10^{-18} m²) that may approximate the permeabilities of shales in the zone of extreme overpressures over geologic time. Simple Rayleigh numbers are inadequate to predict the occurrence of free convection in heterogeneous systems. Salinity-driven free convection at depths in some large sedimentary basins, such as the Gulf of Mexico, may be more common than expected.

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Record 22***Subject: energy – petroleum****Title: High-temp. MWD, LWD tools help South Texas wells**

Authors: Darlington, B; Hicks, T

Source: OIL & GAS JOURNAL; MAR 1, 2004, 102 9, p50-p52, 3p.

Subject Terms: Energy & fuels; petroleum;

Abstract:

Acquiring wellbore and formation data in high-temperature South Texas wells is often limited by the ability of measurement-while-drilling (MWD) and logging-while-drilling technology to operate in hostile wellbore environments. In two recent applications, Newfield Exploration Co. significantly improved on those operational limits when it acquired high-quality data at unprecedented temperature extremes. Accurate real-time MWD steering was accomplished at bottomhole circulating temperatures (BHCT) that reached 363 degrees F. High-quality, triple-combo LWD data were acquired at temperatures greater than 340 degrees F BHCT. In both instances, Newfield performed operations that were previously unachievable due to the limit of existing technology. The ability to perform these operations has a farreaching effect in area drilling operations, as well as in many other hot-hole applications. For the two wells cited in this report, high-temperature steering and logging improved well economics.

Record 23**Subject: energy – petroleum****Title: Shell drills world's first MonoDiameter well in South Texas**

Authors: Sumrow, M

Source: OIL & GAS JOURNAL; OCT 21, 2002, 100 43, p53-p55, 3p.

Subject Terms: Energy & fuels; engineering, petroleum

Abstract: Editorial material

Record 24***Subject: energy – petroleum****Title: Further growth lies ahead for South Texas Wilcox plays**

Authors: Kim, EM; Fisher, WL

Source: OIL & GAS JOURNAL; MAR 1, 1999, 97 9, p79-p83, 5p.

Subject Terms: Energy & fuels; engineering ,petroleum

Abstract:

Ultimate recovery growth modeling by plays in Texas Railroad Commission District 4 (RRC-4) has revealed significant growth for Wilcox natural gas plays. The two major Wilcox natural gas plays in RRC-4 are the Lower Wilcox Lobo Trend (WX-2) and the Wilcox deltaic sandstone in the Rio Grande embayment (WX-4). Plays WX-2 and WX-4 comprise sediments of the Wilcox Group (Paleocene to lower Eocene), a major natural gas production formation and the first major progradational episode in the Tertiary System of the Texas Gulf Coast basin. Natural gas ultimate recovery for plays WX-2 and WX-4 display prominent increasing trends. While ultimate recovery growth

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analysis based on a factor of time for the total 520 major fields of RRC District 4 revealed some general trends of ultimate recovery growth, more vital meaning can be derived by play specific analysis. Plays WX-2 and WX-4 display high structural complexities due to fault compartmentalization.

Record 25

Subject: energy – petroleum

Title: Underbalanced drilling with casing in South Texas

Authors: Bybee, K

Source: JOURNAL OF PETROLEUM TECHNOLOGY; MAR, 2004, 56 3, p55-p56, 2p.

Subject Terms: Energy & fuels; engineering, chemical; engineering, petroleum; Geosciences, multidisciplinary

Abstract: Drilling underbalanced with production casing is improving drilling performance in south Texas fields. This technique is being used to drill depleted sands intermingled with high-pressure (HP) sands in one hole section, resulting in significantly less expensive well plans. This technique makes smaller-reserves targets economical, a key advantage in the mature south Texas Vicksburg play. The full-length paper contains additional examples of new wells drilled underbalanced with casing as well as details of the casing-connection.

Record 26

Subject: energy – petroleum

Title: Effects of diagenesis on enhanced-resolution bulk density logs in tertiary gulf coast sandstones: An example from the lower Vicksburg Formation, McAllen Ranch field, south Texas

Authors: Grigsby, JD; Langford, RP

Source: AAPG BULLETIN; NOV, 1996, 80 11, p1801-p1819, 19p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; Oligocene; sandstones; gulf

Abstract: Diagenetic heterogeneity strongly influences porosity and permeability distribution in sandstone reservoirs of the lower Vicksburg Formation, Enhanced-resolution bulk density logs, which use a 3-cm (1.2-in.) rather than the standard 15-cm (6-in.) sampling increment, offer important new information in understanding diagenetically complex sandstones in the subsurface. Detailed petrographic mapping and sedimentologic description of core from the Oligocene lower Vicksburg Formation of McAllen Ranch field, south Texas, have identified cement variations that result in diagenetic zones ranging in thickness from 0.1 cm (0.04 in.) to 0.9 m (3 ft). The petrographic and petrophysical properties of these diagenetic zones define three diagenetic facies that can be correlated with log response from the enhanced-resolution bulk density log: (1) the quartz-cemented facies, averaging 13% porosity and 0.342 md permeability, and having a recorded density greater than or equal to 2.43 g/cm³ but less than 2.48 g/cm³, (2) the chlorite-cemented facies, averaging 16.7% porosity and 0.193 md permeability, and having a recorded density less than 2.43 g/cm³, and (3) the calcite- or transitional-cemented facies, averaging 9.4% porosity and 0.04 md permeability, and having a recorded density greater than or

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equal to 2.48 g/cm(3),

Intervals cemented with different minerals are identified by the enhanced-resolution bulk density log based on the ranges in density that define each diagenetic facies, This identification of diagenetic facies not only influences the accurate determination of the net sandstone thickness and porosity of reservoirs within the lower Vicksburg Formation, but also directly controls permeability calculations, For example, classification of cement intervals from lower Vicksburg gas reservoirs using enhanced-resolution bulk density logs and porosity and permeability regressions for each of the diagenetic facies results in estimated permeability thicknesses as much as 50% greater than those calculated using standard log analysis. Because standard log analysis ignores the effects of diagenetic heterogeneity, the use of the enhanced-resolution bulk density log provides significant information that leads to more accurate reservoir and field evaluations in diagenetically complex sandstones.

Record 27

Subject: energy – petroleum

Title: Oil and Gas Developments in South Texas in 1989

Authors: AMES, GL

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; OCT, 1990, 74 10, p144-p148, 5p. Part: B

Subject Terms: Energy & fuels; Geosciences, interdisciplinary; engineering, petroleum

Abstract: Drilling activity in south Texas in 1989 declined 23% from 1988. Exploratory drilling in south Texas (Texas Railroad Commission-RRC-Districts 1, 2, and 4) in 1989 declined 15% from 1988; development drilling declined 25%. New-field discoveries totaled 45, a decrease of 11 from 1988. RRC District 1 had an 11% exploratory success rate, RRC District 2 had a 47% exploratory success rate, and RRC District 4 had a 53% exploratory success rate.

Record 28*

Subject: energy – petroleum

Title: Environmental solutions - key successful South Texas line installation

Authors: Council, TL; Hovey, DJ; Cox, ML

Source: OIL & GAS JOURNAL; JUL 24, 2000, 98 30, p70-p72, 3p.

Subject Terms: Energy & fuels; engineering, petroleum

Abstract: The BP Amoco Chemicals Green Lake, Tex., pipeline project was, at time of its construction in May 1999, the world's longest directionally drilled pipeline. Designing and building it required protecting a variety of sensitive environments surrounding the lines and ensuring containing of hazardous products within the pipelines. Stringent requirements imposed by BP Amoco Chemical exceeded even those of the US Environmental Protection Agency, Department of Transportation, and the US Army Corps of Engineers. Project participants engineered and used advanced technological safeguards coupled with construction methods to address environmental sensitivity.

Record 29

Subject: energy – petroleum

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Title: Radiogenic heat production in sedimentary rocks of the Gulf of Mexico basin, south Texas

Authors: McKenna, TE; Sharp, JM

Source: AAPG BULLETIN; MAR, 1998, 82 3, p484-p496, 13p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; sandstones; temperature TH-230

Abstract: Radiogenic heat production within the sedimentary section of the Gulf of Mexico basin is a significant source of heat, Radiogenic heat should be included in thermal models of this basin (and perhaps other sedimentary basins), We calculate that radiogenic heat may contribute up to 26% of the overall surface heat-flow density for an area in south Texas. Based on measurements of the radioactive decay rate of alpha-particles, potassium concentration, and bulk density, we calculate radiogenic heat production for Stuart City (Lower Cretaceous) limestones, Wilcox (Eocene) sandstones and mudrocks, and Frio (Oligocene) sandstones and mudrocks from south Texas, Heat production rates range from a low of 0.07 +/-0.01 mu W/m(3) in clean Stuart City limestones to 2.21 +/-0.24 mu W/m(3) in Frio mudrocks, Mean heat production rates for Wilcox sandstones, Frio sandstones, Wilcox mudrocks, and Frio mudrocks are 0.88, 1.19, 1.50, and 1.72 mu W/m(3), respectively. In general, the mudrocks produce about 30-40% more heat than stratigraphically equivalent, sandstones, Frio rocks produce about 15% more heat than Wilcox rocks per unit volume of elastic rock (sandstone/mudrock). A one-dimensional heat-conduction model indicates that this radiogenic heat source has a significant effect on subsurface temperatures, If a thermal model were calibrated to observed temperatures by optimizing basal heat-flow density and ignoring, sediment heat production, the extrapolated present-day temperature of a deeply buried source rock would be overestimated.

Record 30

Subject: energy – petroleum

Title: Sedimentary Features of the South Texas Continental-slope as revealed by side-scan sonar and high-resolution seismic data

Authors: ROTHWELL, RG; KENYON, NH; MCGREGOR, BA

Source: AAPG BULLETIN; FEB, 1991, 75 2, p298-p312, 15p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; shelf; echo character

Abstract: Sedimentary provinces on the south Texas slope have been identified by their acoustic character on long-range side-scan sonar records.and high-resolution seismic profiles. Probable lithofacies within these provinces have been identified by core data and by analogy with previously cored acoustic facies. In the northern part of the study area, the East Breaks Slide is a prominent mass-transport feature. Revised bathymetry shows that the slide originated on the upper slope (200-1000 m), in front of a sandy late Wisconsinan shelf-margin delta, where the gradient is up to 3-degrees. It was deposited in a middle slope position (1000-1500 m) where the gradient is about 0.5-degrees. Side-scan sonar data indicates that the slide is a strongly backscattering feature extending more than 110 km downslope from the shelf edge. It consists of two lobes that are separated by a diapiric high. Diapiric highs on the middle slope

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have blocked most of the flow. Borehole data shows that the slide deposit contains intercalated sands and contorted bedding. The slide is therefore attributed to failure of sandy deltaic material deposited close to the shelf edge during the last period of low sealevel (late Wisconsinan, circa 11-29 Ka). Core data suggests that the weakly backscattering acoustic facies adjacent to the slide are fine-grained sediments (mudturbidites and hemipelagites) of a slope mud drape. The middle slope in front of the sandy late Wisconsinan shelf-margin delta of the Rio Grande has an intermediate level of backscattering with numerous channels leading to the Sigsbee Deep. These channels are believed to be part of the northern lobe of the Rio Grande Fan. Acoustic facies mapping using long-range side-scan sonar matches well with acoustic facies mapping using 3.5-kHz high-resolution seismic profiles. Within this study area higher levels of GLORIA backscatter are returned from sea floors containing shallow sub-bottom sand than from muddy sea floors.

Record 31*

Subject: energy – petroleum

Title: Exploring for Subtle Traps with High-Resolution Paleogeographic Maps: Reklaw 1 Interval (Eocene), South Texas: Discussion

Authors: SAMS, RH

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; NOV, 1990, 74 11, p1754-p1756, 3p.

Subject Terms: Energy & fuels; geosciences, interdisciplinary; engineering, petroleum

Abstract: High-resolution paleogeographic maps depicting the depositional history of the Reklaw 1 interval provide a basis for prospecting for subtle traps in the updip Reklaw trend in south Texas. The Reklaw 1 interval began with sand being carried southwestward by longshore currents to form the barrier bar that became Atkinson field. The hydrocarbons were trapped by the updip pinch-out of barrier-bar sand into lagoonal mud. Stratigraphic traps similar to Atkinson field could be present along depositional strike if the sand in the field were part of an extensive barrier-bar system. After the barrier bar formed, distributary mouth bars prograded seaward, depositing the bar-finger sands that became the Hysaw and Flax fields. Subtle structural traps could be present today where small up-to-the-coast faults associated with the sample fault system cut the bar-finger sands downdip from established production. Farther down paleoslope, the distributary channels began to bifurcate and the distributary mouth bars coalesced to form a broad delta-front sheet sand. Burnell, Hondo Creek, and Runge West fields produce from this sheet sand at the unstable shelf margin. A rapid rise in relative sea level terminated the Reklaw 1 interval. Many of the oil and gas fields still to be discovered in the US are in mature petroleum provinces where much of the remaining oil and gas probably resides in subtle traps. High-resolution paleogeographic maps are the key to finding these subtle traps. 11 figures, 2 tables.

Record 32

Subject: energy – petroleum

Title: Mapping sediment-dispersal patterns and associated systems tracts in fourth- and fifth-order sequences using seismic sedimentology: Example from Corpus Christi Bay, Texas

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Authors: Zeng, HL; Loucks, RG; Brown, LF

Source: AAPG BULLETIN; JUL, 2007, 91 7, p981-p1003, 23p.

Subject Terms: **Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; Gulf-of-Mexico; basin; stratigraphy**

Abstract: A seismic-sedimentologic study was performed to map fourth- and fifth-order systems tracts in Oligocene (Frio) strata in Corpus Christi Bay, south Texas. Guided by third-order sequence-stratigraphic correlations from seismic and wire-line-log data, we prepared stratal slices from a three-dimensional seismic volume to reveal high-resolution (10-m [33-ft] levels) sediment dispersal patterns and associated systems tracts in a relative geologic-time domain. On average, 1200 m (3940 ft) of sediments were deposited in the third-order lowstand expansion cycle, and at least 16 higher order sequences (fourth- and fifth-order sequences) were recognized. Three types of depositional systems were identified in the Frio stratigraphic section: (1) offshore lowstand slope fans that are best characterized by submarine channel and levee systems inside and outside incised submarine channels and by fan-shaped sand body geometry; (2) lowstand prograding deltaic systems that are composed of strike-oriented and lobate deltaic sand bodies; and (3) highstand systems that are represented by onshelf barrier, lagoon, and deltaic systems. Higher order sequence development was controlled by the interaction of relative sea level change, sediment supply, and gravity tectonics. The top of sediment ridges was eroded or decapitated during many of the higher order sequences. Sand dispersal patterns are primarily controlled by accommodation resulting from rollover topography associated with growth faulting. Between the boundary fault and the hinge line atop rollover structures, strike-oriented sandstone bodies dominate; within submarine channels and incised valleys and beyond the hinge line to the distal basin, dip-oriented sandstone bodies prevail. Sandstone thickness and dispersal patterns can be predicted by integrating wire-line-log measurements and seismic amplitude patterns.

Record 33*

Subject: energy – petroleum

Title: **Technology tackles low-permeability sand in South Texas**

Authors: Swift, TE; Mladenka, P

Source: OIL & GAS JOURNAL; SEP 29, 1997, 95 39, p68-p&, 4p.

Subject Terms: **Energy & fuels; engineering, petroleum**

Abstract: Through aggressive applications of advanced technology, Swift Energy Co. increased its natural gas and oil production from the AWP Olmos field in South Texas by more than fivefold in less than 2 1/2 years. At the same time, it substantially reduced per unit development and production costs. Gross daily production was more than 67 MMcf equivalent by mid-1997, compared to about 12 MMcf in early 1994. With 16,000 net acres successfully developed through mid-1997, significant savings were realized in both costs and in manpower requirements. Swift's expertise in designing and executing hydraulic fracture stimulations remains the critical component of its AWP field operation.

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Record 34**Subject: energy – petroleum****Title:** Exploring for Subtle Traps with High-Resolution Paleogeographic Maps: Reklaw 1 Interval (Eocene), South Texas: Reply**Authors:** BREYER, JA; BULLING, TP**Source:** AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; NOV, 1990, 74 11, p1757-p1760, 4p.**Subject Terms:** Energy & fuels; geosciences, interdisciplinary; engineering, petroleum**Abstract:** Reply to the article: Exploring for Subtle Traps with High-Resolution Paleogeographic Maps: Reklaw 1 Interval (Eocene), South Texas: Discussion**Record 35****Subject: energy – petroleum****Title:** Regional Variations in Formation Water Chemistry – Major and minor elements; Frio Formation Fluids; Texas**Authors:** MACPHERSON, GL**Source:** AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; MAY, 1992, 76 5, p740-p757, 18p.**Subject Terms:** Energy & fuels; geosciences, interdisciplinary; engineering, petroleum; Oligocene; basin, chemical constraints; Gulf-Coast**Abstract:** Spatial variation of major element content (Na, Ca, and Cl) in formation waters in the Oligocene Frio Formation, Texas, show that mixing occurs vertically and that the chemistry of Ca-rich fluids varies from northern coastal to southern Texas. Relative amounts of major and minor elements (Sr, Mg, and K) in Ca-rich fluids from south Texas differ from those in other areas of Texas and also are different from updip Mesozoic fluids. Such differences seem to preclude the known Mesozoic fluids as a source of Ca in the south Texas Frio Formation fluids, barring complicated, nonuniform water-rock alteration changing the Mesozoic-fluid composition. Approximately coast parallel (and strike parallel) Cross sections show that Ca-rich fluids in the Frio are usually found at depth. Some anomalies occur where fluids are present near piercement structures and in a relatively large part of south Texas. In the latter region, Ca-rich fluids exist above the top of geopressure, suggesting that they may have been emplaced before geopressure became widespread (2-3 m.y. ago). Because there are no shallow Ca-rich fluids in the vicinity of major river systems in south Texas, meteoric fluids may have flushed Ca-rich fluids out of the areas near the rivers during past pluvial periods. This process does not preclude the dilution of formation water by clay, dehydration reactions, another process that has been proposed to explain deep, dilute formation waters in Gulf basin reservoirs.**Record 36*****Subject: energy – petroleum****Title:** New Pipeline Coating System Speeds South Texas Rehab**Authors:****Source:** OIL & GAS JOURNAL; JAN 29, 1990, 88 5, p94-p95, 2p**Subject Terms:** Energy & fuels; engineering, petroleum**Abstract:** "Natural Gas Pipeline Co. of America recently employed a new pipeline-coating

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system during rehabilitation of a 25.4-mile, 26-in. pipeline section in South Texas. Major components of the system were designed for CRC-Evans Pipeline International Inc., Tulsa, by Incal Inc., Houston. After manufacture in CRC-Evans' Tulsa facility, Incal tested and commissioned the unit in the field and provided project management and on-site services during the job."

Record 37*

Subject: energy – petroleum

Title: TransTexas hikes gas flow in South Texas

Authors: Koen, AD

Source: OIL & GAS JOURNAL; JUL 8, 1996, 94 28, p32-p33, 2p

Subject Terms: Energy & fuels; engineering, petroleum

Abstract: Editorial material

Record 38

Subject: energy – petroleum

Title: Fluvial Sedimentology and Architecture of The Middle Frio Formation (Oligocene), Jim-Wells, Kleberg, and Nueces Counties, South Texas

Authors: KERR, DR

Source: AAPG BULLETIN; MAR, 1991, 75 3, p608-p609, 2p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

Abstract: "The middle Frio Formation of the northeastern Gueydan fluvial system comprises fluvial and overbank deposits averaging 2000 to 3000 ft in thickness. Discrete genetic intervals are defined from subsurface studies using four cores totaling 575 ft, high-resolution resistivity borehole images, and electric logs. A genetic interval is composed of four facies: (1) Channel-fill facies (30-ft thick and 2500-ft wide) includes an overall fining-upward texture and upward diminution in sedimentary structure scale: intraclast gravel lag; large-scale trough cross-stratified, medium-grained sandstone; parallel-stratified and ripple-laminated fine-grained sandstone to sandy mudstone containing pedogenic nodules and root molds. Departure from the overall vertical trend within the channel-fill facies is common and is regarded as the result of chute-channel development processes. (2) Splay fine-grained sandstones (up to 20-ft thick) are parallel-stratified and ripple-laminated and are organized into beds with variable vertical thickness trends. (3) Levee sandstones and mudstones are thinly bedded with low-angle surfaces and slump structures. (4) Floodplain mudstones contain structures and fabrics indicating variable wet and dry conditions (e.g., vertisol-type paleosols)."

Record 39

Subject: energy – petroleum

Title: Reservoir Petroleum Geochemistry of Sarita (South Texas), Eugene Island 330 and South Marsh Island 128 (Offshore Louisiana) Oil-Fields

Authors: RAFALSKA, JK; COMET, PA; KENNICUTT, MC; MCDONALD, TJ; BROOKS, JM

Source: AAPG BULLETIN; AUG, 1991, 75 8, p1419-p1419, 1p.

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Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

Abstract: Hydrocarbon fluid compositions within three petroleum fields were shown to be heterogeneous in some aspects while appearing to have a common source for each field. However biomarker parameters indicate that three difference sources were respectively responsible for each field accumulation. Visual inspection of whole oil chromatograms, gasoline molecular composition, and quantitative concentrations of biomarkers were used to define the range of fluid chemistries observed. Biomarker compositions and content were nearly identical regardless of depth of production, suggesting that all reservoirs within a field were filled with a common fluid. Fluids in reservoirs of the Sarita and Eugene Island 330 fields were biodegraded to varying degrees in the shallowest sand reservoirs. Hydrocarbon fluids in these two fields were also altered by evaporative fractionation, a phase segregation allowing condensate to occur shallower than oil. Alteration due to evaporative fractionation is related to secondary injection of post mature gas and subsequent remigration up faults. South Marsh Island 128 fluids are in a nearly pristine condition. Whole-oil fingerprints and gasoline composition are specific to a given pay zone of fault block and can be used as a correlation tool. Communication between reservoirs is indicated by a common fluid chemistry, whereas fluid chemistry variations suggest compartmentalized accumulations. The scale examination of fluid chemistry within fields can help define the history of reservoir filling and changes in fluid properties during field development and production.

Record 40*

Subject: energy – petroleum

Title: Short-time-scale (year) variations of petroleum fluids from the U.S. Gulf Coast

Authors: JEAN K. WHELAN; LORRAINE EGLINTON; MAHLON C. KENNICUTT II; and YAORONG QIAN

Source: Geochimica et Cosmochimica Acta, Vol. 65, No. 20, pp. 3529–3555, 2001

Subject Terms: Energy; petroleum; Gulf Coast

Abstract: Evolving short-term (less than 5 yr) compositional changes in hydrocarbon charge from some Eugene Island Block 330 (EI-330) wells are demonstrated. Storage, analytical, and production artifacts are shown to be minimal. In some wells, compositions remain constant from 1985 to 1993, whereas in others in the same reservoir, significant changes are observed. In some cases, temporal variability is greater than spatial variability. Maximum temporal change is strongest for specific compounds: toluene and C6 to C9 normal alkanes, but is also observed to a lesser extent for higher-molecular-weight components (up to n-C32). Principal coordinate analysis shows the highest degree of overall temporal compositional change over an 8-yr period in the shallowest wells where there is also evidence of biodegradation. Small temporal compositional changes are also observed in two deeper wells that are below the thermal window favorable for biodegradation. An exception is an unusual oil, where a very large increase in toluene, as well as smaller changes in a number of n-alkanes, was observed in 1993. The $\delta^{13}\text{C}$ compound-specific isotopic signature of toluene, in addition to several other C7-C8 compounds in this oil, yields convincing evidence that it is related to the same family as other EI-330 oils and unlikely to be due to a drilling or laboratory contaminant. Minor isotopic differences in other C7

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compounds (1.5%) are consistent with extensive gas washing of this oil. The short-term compositional changes in EI-330 oils are attributed to gas washing, which causes overprinting of biodegraded oils with light n-alkanes in shallower GA and HB reservoirs where oils are currently being biodegraded in situ. Patterns of smaller changes in heavier compounds in both shallower and deeper wells are also consistent with this interpretation. Copyright © 2001 Elsevier Science Ltd

Record 41*

Subject: energy – petroleum

Title: **Review: The role of constructed reefs in non-indigenous species introductions and range expansions**

Authors: Daniel J. Sheehy; Susan F. Vik

Source: Ecological Engineering 36(1):1-11

Subject Terms: **Constructed reefs; non-indigenous species; invasive species; Gulf of Mexico; decommissioned petroleum platforms; inactive ships; artificial reefs; coastal energy structures**

Abstract: Constructed reefs can contribute to non-indigenous species (NIS) introductions or range expansions in several ways. Reef materials that retain developed fouling communities or ballast, such as decommissioned petroleum platforms, inactive or derelict ships, and bridge rubble are potential NIS vectors. Habitat provided by reefs placed in areas devoid of natural hard bottom or structure may be colonized by NIS propagules dispersed from natural or anthropogenic sources. A network of reef structures may also create NIS corridors for linking previously unconnected areas. Due to its level of offshore habitat alteration, changing environmental conditions, volume of shipping and boating traffic, and subtropical location, the Gulf of Mexico may be particularly vulnerable to NIS introductions and has a number of documented NIS. Non-indigenous or invasive species concerns have delayed and increased costs for some recent reef construction projects. The linkages between NIS and constructed reefs are reviewed, and approaches for anticipating, assessing, and controlling introductions are recommended. Using basic information about NIS risks, reef planners can begin to evaluate unintended consequences and incorporate risk management measures to reduce future introductions. Prevention is the most effective risk reduction approach because controlling marine NIS after introduction is expensive and offers limited probability for success.

Record 42

Subject: energy – petroleum

Title: **Diagenesis of Sandstones at Shale Contacts and Diagenetic Heterogeneity, Frio Formation, Texas**

Authors: SULLIVAN, KB; MCBRIDE, EF

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; JAN, 1991, 75 1, p121-p138, 18p.

Subject Terms: **Energy & fuels; engineering, petroleum; geosciences, interdisciplinary; South Texas; Oligocene; sediment; metamorphism**

Abstract: Diagenetic trends near sandstone/shale contacts were studied in 12 cored sequences from four wells between depths of 5200 and 15,700 ft (1585 and 4785 m) to evaluate

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the heterogeneity of diagenetic processes on a local scale and to evaluate the hypothesis that reactive aqueous fluids and components for cements in sandstones were derived from adjacent shales. The only evidence suggesting that diagenetic components in sandstones were derived from immediately adjacent shales is an increase in chlorite cement in sandstones toward contacts with shale beds for two of three contacts appropriate for study. Secondary pores and cements of quartz, carbonate, and kaolinite do not correlate with proximity to shale beds, but have a preference for sandstones that had relatively high initial porosities and permeabilities. Thus, the flux of formation water and probably long-distance transportation of diagenetic components were more important influences on reservoir quality of sandstones than was the local availability of components. Multiple regression of 22 independent variables indicates that the best predictors of secondary porosity are kaolinite cement and intergranular porosity. Sandstone sequences are extremely heterogeneous in the distribution of total thin section porosity, secondary porosity, and quartz and carbonate cements; in addition, they have significant variations in the abundance of kaolinite and chlorite cements. Mass balance calculations for silica and aluminum indicate silica was imported to and aluminum was exported from the sandstones.

- Record 43** **Subject: energy – petroleum**
- Title:** Relationships between cement, rock fabric, porosity and permeability, lower Vicksburg formation, mcallen ranch field, South Texas
- Authors:** GRIGSBY, JD; LANGFORD, RP
- Source:** AAPG BULLETIN; MAR, 1991, 75 3, p587-p587, 1p.
- Subject Terms:** Energy & fuels; engineering, petroleum; geosciences, multidisciplinary
- Abstract:** Meeting Abstract
-
- Record 44** **Subject: energy – petroleum**
- Title:** Exploitation of Oil in a Volcanic Cone by Horizontal Drilling in The Elaine Field, South Texas
- Authors:** MARTINEZ, PA; KUSHNER, PL; HARBAUGH, JW
- Source:** AAPG BULLETIN; MAR, 1991, 75 3, p630-p630, 1p
- Subject Terms:** Energy & fuels; engineering, petroleum; geosciences, multidisciplinary
- Abstract:** Meeting abstract.
-
- Record 45** **Subject: energy – petroleum**
- Title:** Sequence Stratigraphy and Sedimentology of a Shelf-Margin Lowstand Wedge in The Deep Wilcox Flexure Trend of South-Texas
- Authors:** SNEDDEN, JW; COOKE, JC; JOHNSON, RK; CONRAD, KT
- Source:** AAPG BULLETIN; MAR, 1991, 75 3, p673-p673, 1p.
- Subject Terms:** Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

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Abstract: Meeting abstract.

Record 46

Subject: energy – petroleum

Title: The Exploration Potential of The Downdip Yegua in South Texas

Authors: CUMMINS, GD; WINKELMAN, BE; ROSEN, RN

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; SEP, 1991, 75
9, p1519-p1519, 1p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

Abstract: Meeting abstract.

Record 47

Subject: energy – petroleum

**Title: Diagenetic Variability in Middle Frio Formation Gas-Reservoirs (Oligocene),
Seeligson and Stratton Fields, South Texas**

Authors: GRIGSBY, JD; KERR, DR

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; SEP, 1991, 75
9, p1524-p1524, 1p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

Abstract: Meeting abstract.

Record 48

Subject: energy – petroleum

**Title: Recognition and Implications of Volcanic Glass Detritus in The Fluvial Deposits of
The Middle Frio Formation, South Texas**

Authors: KERR, DR; GRIGSBY, JD

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; SEP, 1991, 75
9, p1527-p1527, 1p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

Abstract: Meeting abstract.

Record 49

Subject: energy – petroleum

**Title: Depositional-Environments and Reservoir Compartmentalization Within The Frio
Zone 21-B Reservoir, Tijerina-Canales-Blucher Field, South Texas**

Authors: REISTROFFER, JR; TYLER, N

Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; SEP, 1991, 75
9, p1536-p1536, 1p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary

Abstract: Meeting abstract.

Record 50

Subject: energy – petroleum

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Title: Horizontal Exploitation of The Upper Cretaceous Austin Chalk of South Texas
Authors: BORKOWSKI, R
Source: AAPG BULLETIN-AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS; JAN, 1991, 75 1, p198-p198, 1p.
Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary
Abstract: Meeting abstract.

Record 51* **Subject: energy – petroleum**

Title: Buda Strikes May Boost South Texas Action
Authors: PETZET, GA
Source: OIL & GAS JOURNAL; MAY 14, 1990, 88 20, p25-p25, 1p.
Subject Terms: Energy & fuels; engineering, petroleum
Abstract: Editorial material

Record 52 **Subject: energy – petroleum**

Title: Miocene chronostratigraphy, paleogeography, and play framework of the Burgos Basin, southern Gulf of Mexico
Authors: Hernandez-Mendoza, JJ; Hentz, TF; DeAngelo, MV; Wawrzyniec, TF; Sakurai, S; Talukdar, SC; Holtz, MH
Source: AAPG BULLETIN; NOV, 2008, 92 11, p1501-p1535, 35p.
Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; shelf
Abstract: This study characterizes Miocene chronostratigraphy and plays in the Burgos Basin and adjacent south Texas within an area of approximately 39 700 km² (15,300 mi²), onshore and offshore (to the 500-m [1640-ft] isobath). Using greater than 40,000 linear kilometers (25,000 mi) of two-dimensional seismic lines, 115 onshore wells, 9 offshore wells, and paleontological data, we established a correlation framework of 9 key surfaces (upper Oligocene to lower Pliocene) representing major (probably third-order) sequence boundaries and maximum flooding surfaces throughout the basin. Five of the Burgos Miocene surfaces coincide with regional chronostratigraphic surfaces from the Veracruz and Laguna Madre-Tuxpan basins, thus establishing a consistent correlation framework throughout much of the Mexican Gulf Coast Basin. Twenty Miocene plays are defined by four age divisions (Gower Miocene, middle Miocene, upper Miocene 1, and upper Miocene_2) and four paleogeographic settings (unexpanded and expanded shelf, proximal slope, and distal slope). Because of proven high productivity in salt-bounded basins in the northern Gulf of Mexico, the onlap of strata onto diapirs in the eastern Burgos salt province was evaluated as a fifth setting. The paleogeographic provinces and onlap areas exhibit characteristic seismic facies, stratal geometries, and structural relations; a characterization of each one of these being key to the overall play evaluation. This play framework provides the means for continuing exploration of Miocene strata and evaluation of key play elements (reservoir presence and quality, seal, trap, source, and migration and timing) in this structurally complex, under-explored basin. The

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relative importance of these play elements varies systematically for each play, especially between the onshore shelf plays and the offshore deep-water plays, where fault complexity and stratigraphic variability are greater.

Record 53

Subject: energy – petroleum

Title: Heat flow and thermal history of the Anadarko basin, Oklahoma

Authors: Carter, LS; Kelley, SA; Blackwell, DD; Naeser, ND

Source: AAPG BULLETIN; FEB, 1998, 82 2, p291-p316, 26p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; South Texas; Temperature; Subsurface; Fission tracks; vitrinite reflectance

Abstract: New heat-flow values for seven sites in the Anadarko basin, Oklahoma, were determined using high-precision temperature logs and thermal conductivity measurements from nearly 300 core plugs. Three of the sites are on the onshore shelf, three sites are in the deep basin, and one site is in the frontal fault zone of the northern Wichita Mountains. The heat flow decreased from 55 to 64 mW/m² in the north, and from 39 to 54 mW/m² in the south, due to a decrease in heat generation in the underlying basement rock toward the south. Lateral lithologic changes in the basin, combined with the change in heat flow across the basin, resulted in an unusual pattern of thermal maturity. The vitrinite reflectance values of the Upper Devonian-Lower Mississippian Woodford formation are highest 30-40 km north-northwest of the deepest part of the basin. The offset in highest reflectance values is due to the contrast in thermal conductivity between the Pennsylvanian "granite wash" section adjacent to the Wichita uplift and the Pennsylvanian shale section to the north. The geothermal gradient in the low-conductivity shale section is elevated relative to the geothermal gradient in the high-conductivity "granite wash" section, thus displacing the highest temperatures to the north of the deepest part of the basin.

Record 54

Subject: energy – nuclear energy

Title: Nuclear new build in the United States 1990–2010: A three state analysis

Authors: Raphael J. Heffron

Source: Technological Forecasting & Social Change

Subject Terms: Nuclear energy policy; nuclear new build; technology; lessons learned; state law; public administration

Abstract: This research examines nuclear energy policy across three states in the United States (US) – Georgia, Pennsylvania, and Texas – from 1990 to 2010. Therefore, the nuclear energy crisis at Fukushima in Japan March 2011 is beyond the scope of this paper. Nevertheless, the fundamental conclusions of this research remain valid, as the impact of Fukushima is not yet known and in addition the US has experienced its own crisis in Three Mile Island, which has shaped its own nuclear industry to an extent already. Interviews are at the core of the research methodology employed, which is similar to other in-depth studies on nuclear new build. The aim of this paper is to identify and clarify those aspects of the legal, economic, and political requirements of the US that affect prospects for nuclear new build but which, so far, have not been

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well understood by experts. The research provides these new insights through a unique comparison of US states which have deregulated, regulated and 'hybrid' electricity markets. It is evident that law can play a central role in the nuclear energy sector, and the role of state-driven policy in the nuclear energy sector is also demonstrated. Further, the methodology identifies key assumptions within the nuclear sector in the US that are contested, and delivers lessons on how these contested issues may be resolved. The paper adds to the literature in public administration, legal development and nuclear energy policy, and in particular nuclear new build.

Record 55*

Subject: energy – nuclear energy

Title: Power Supplier Giles for 2 New Reactors.

Authors: H. H.

Source: Mechanical Engineering; Nov2007, Vol. 129 Issue 11, p11-11, 1/2p

Subject Terms: nuclear power plants; nuclear reactors; electricity; nuclear energy; magnetism

Abstract: The article reports that NRG Energy Inc., a wholesale energy supplier, and South Texas Project Nuclear Operating Co. have filed an application with the U.S. Nuclear Regulatory Commission to add two reactors to a nuclear plant operating in Matagorda County, Texas. These companies are seeking to add a third and fourth reactor that will double the output of a plant called the South Texas Project. Together, the new reactors will be capable of generating 2,700 megawatts of electricity. The filing is made under new rules that permit a company to apply for a single permit to both build and operate a nuclear reactor.

Record 56*

Subject: energy – nuclear energy

Title: Nuclear Fallout

Authors: Lesser, Jonathan A.

Source: Natural Gas & Electricity; May2011, Vol. 27 Issue 10, p31-32, 2p

Subject Terms: Nuclear industry; clean energy industries; renewable energy sources; Fukushima nuclear accident, Japan 2011

Abstract: The article presents the author's comments on the impact of nuclear plant accident in Japan on the nuclear power industry. He says that every nuclear plant accident leads to the demands for closing all nuclear plants. He says that after Japanese nuclear accident, NRG postponed its plans of building nuclear stations in Texas due to increased regulatory and financial difficulties. According to him, the accident also fueled the demand for clean and renewable energy.

Record 57

Subject: energy – nuclear power

Title: South Texas Project - STP converts from 'ponderous bus' to 'sleek sports car'

Authors: Hylko, JM

Source: POWER; MAR-APR, 1997, 141 2, p53-p&, 4p.

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Subject Terms: Energy & fuels

Abstract: Profiles the South Texas Project, a two-unit nuclear powerplant managed by the Houston Lighting & Power Co. Plant's completion of a refueling outage in 30 days that has become its hallmark of maturity; Start of efforts to achieve world-class status in February 1993. INSET: South Texas Project sharpens management edge..

Record 58

Subject: energy – nuclear power

Title: South Texas Project - From 'watch list' to 'world class' performance in five years

Authors: Strauss, SD; Hylko, J

Source: POWER; MAY-JUN, 1998, 142 3, p49-p+, 4p.

Subject Terms: Energy & fuel

Abstract: Highlights the Houston Lighting and Power Company's South Texas Nuclear Project located in Matagorda Bay. Details on the output of the energy plant; Consideration of the plant as 'one of the best' nuclear plants in the United States by the Nuclear Energy Institute; Promotion of safety culture, outage proficiency, and technical innovation by the plant; Detailed information on the plant.

Record 59*

Subject: energy – nuclear energy

Title: The Nuclear Energy Market and The Nonproliferation Regime

Authors: Braun, Chaim

Source: Nonproliferation Review; Nov2006, Vol. 13 Issue 3, p627-644, 18p, 5 Charts

Subject Terms: Nuclear energy; nuclear fuels; nuclear power plants

Abstract: This article presents a review of the sensitivities to proliferation attempts in each of the different stages of the commercial nuclear fuel cycle and within the nuclear power industry. As the global nuclear power industry may be on the brink of a major expansion that might rival its original growth at the inception of the nuclear age, the question is: Would this second expansion create uncontrollable proliferation risks in its wake? The basic answer is that the nuclear power industry in itself does not pose a direct proliferation threat; however, various elements of the nuclear fuel cycle could create different proliferation sensitivities if not safeguarded carefully. The first element of securing the nuclear fuel cycle is the understanding of which elements pose the greatest potential for successful proliferation attempts. These issues and several institutional and technical mitigation strategies to reduce the potential for possible proliferation are discussed here.©

Record 60*

Subject: energy – nuclear energy

Title: Evaluating Methodologies: A Procedure and Application to Nuclear Power Plant Siting Methodologies

Authors: Ford, Coleen K.; Keeney, Ralph L.; Kirkwood, Craig W.

Source: Management Science; Jan1979, Vol. 25 Issue 1, p1-10, 10p

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Subject Terms: Nuclear power plants; electric power production; electric utilities; nuclear energy

Abstract: A procedure is presented to evaluate the appropriateness of alternative methodologies for analyzing a specified problem. This procedure is illustrated by identifying desirable characteristics of nuclear power plant site selection methodologies and evaluating the adequacy of methodologies that have been used to select nuclear power plant sites. Objectives of such siting methodologies are specified and attributes developed to measure the degree of attainment of each objective. Several siting methodologies are rated on the various attributes and these ratings are analyzed to determine the adequacy of each methodology.©

Record 61*

Subject: energy – nuclear power

Title: The Current “Nuclear Renaissance” in The United States, Its Underlying Reasons, and Its Potential Pitfalls

Authors: Frye Jr., Roland M.

Source: Energy Law Journal; 2008, Vol. 29 Issue 2, p279-379, 101p, 1 Chart

Subject Terms: Nuclear power plants; mineral industries; nuclear industry; renaissance; uranium; global warming; nuclear energy; nuclear nonproliferation; terrorism

Abstract: The nuclear renaissance is indeed a reality within the United States today. This is apparent from the number of nuclear plant construction applications and new uranium mining applications filed with or expected by the Nuclear Regulatory Commission, as well as the major merger-and-acquisitions activity within the nuclear industry. This renaissance stems from such factors as concern over global warming, nuclear energy's advantages over competitor fuels, a significant increase in public and governmental support, major scientific and technological developments, and the financial community's increasing interest in nuclear energy. But, a number of factors could still undermine the success of nuclear energy - such as workforce and component manufacturing constraints, the recent "Wall Street meltdown," a catastrophe at a nuclear power facility anywhere in the world, a terrorist attack using nuclear material, blocked transportation of radioactive material, regulatory and adjudicatory delays, self-inflicted wounds by the industry, and concerns about proliferation and spent fuel management. The industry's success in the coming years will turn largely on money, attention to detail, and an ability to earn and retain the trust of all its stakeholders.©

Record 62

Subject: energy – nuclear power

Title: Nuclear Power Prospects in The USA: The Continuing Problem of The Waste Issue

Authors: Bezdek, Roger H.

Source: Energy & Environment; 2009, Vol. 20 Issue 3, p375-385, 11p, 5 Charts, 2 Graphs

Subject Terms: Nuclear energy; radioactive wastes; Energy industries; power plants; coal; natural gas; electricity

Abstract: This paper addresses two questions concerning the economics and prospects for nuclear power in the USA: 1) What is the long term economic future of nuclear energy? 2) Is the inability to solve the nuclear waste issue a factor that will limit new

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nuclear plant development? With respect to the first question, we find that the long term economic future of nuclear energy is uncertain, at best. Despite recent interest in a "nuclear renaissance," objective, rigorous studies have concluded that, at present, new nuclear power plants are not economically competitive with coal or natural gas for electricity generation and will not be for the foreseeable future. With respect to the second question, we find that the inability to solve the nuclear waste issue will likely limit new nuclear plant development. Nuclear waste disposal poses a serious, seemingly intractable problem for the future of nuclear power, and the waste issue could be a show stopper for new nuclear plants. Thus, while some new nuclear power plants will likely be built in the U.S. over the next two decades, a major "nuclear renaissance" is unlikely.©

Record 63*

Subject: energy – nuclear power

Title: Major structural elements of the Miocene section, Burgos Basin, northeastern Mexico

Authors: Hernandez-Mendoza, JJ; DeAngelo, MV; Wawrzyniec, TF; Hentz, TF

Source: AAPG BULLETIN; NOV, 2008, 92 11, p1479-p1499, 21p.

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; Gulf-of-Mexico

Abstract: Major Miocene structural elements of the Burgos Basin include a regionwide detachment system that connects extensional fault systems throughout the basin with an active diapir belt down-dip, a regionwide pattern of downthrown extensional rollover folds, pervasive secondary faults, and salt and shale diapiric masses in the eastern part of the basin. An interpretation of two-dimensional seismic data suggests that the Burgos Basin Miocene section can be divided into four structural domains: expanded zone, Lamprea trend, Corsair-Wanda trend, and diapir belt. The westernmost unexpanded zone is the footwall of the expanded system part of the basin, which overlies a domain of Oligocene extension. Remaining trends represent an extensional accommodation related to the basinward migration of mobile salt and shale, which has produced a relatively uniform structural style in the Miocene section. The structural style observed in the Burgos Basin appears to define a transitional zone between gravitational collapse in the offshore Laguna Madre-Tuxpan shelf to the south and salt-related raft tectonics of the south Texas Gulf Coast.

Record 64*

Subject: energy – nuclear power

Title: All eyes on Texas

Authors: Smith, T; Wiese, M

Source: POWER; NOV-DEC, 2003, 147 9, p47-p+, 4p.

Subject Terms: Energy & fuels

Abstract: Getting caught with white powdery substances will always get you in trouble. Not with the police, but-if you operate a nuclear reactor-with the NRC. Here's POWER's exclusive look at the behind.-the-scenes work that got South Texas Project Unit 1 back on-line after-the-discovery and repair of two flawed reactor vessel penetration

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nozzles.

Record 65*

Subject: energy – gas

Title: **A Thematic Analysis of Local Respondents' perceptions of Barnett Shale Energy Development**

Authors: Wynveen, Brooklynn J.

Source: Journal of Rural Social Sciences 2011, Vol. 26 Issue 1, p8 24p.

Subject Terms: **Energy; offshore oil well drilling; natural gas; environmental impact analysis**

Abstract: Researchers have found that the economic, social, and environmental impacts of energy development vary with both the type and location of development. Previous studies have highlighted impacts associated with the conventional energy development that occurred in the western United States in the 1970s and 1980s, and with offshore oil drilling in the Gulf of Mexico. Recently, however, unconventional natural gas development has become a more common type of energy development, the impacts of which are not yet well understood. To assess these impacts, as part of a larger quantitative study conducted within two Texas counties, survey respondents were invited to share "additional comments" as desired. I analyzed these comments using open coding and constant comparison to identify prominent themes for each county. Themes ranged from positive to negative, and reflected economic, social, and environmental impacts accompanying unconventional natural gas development. Findings may inform theory and be of interest to community leaders and others interested in the impacts of unconventional gas development.

Record 66

Subject: energy – gas

Title: **Bob West field: Extending upper Wilcox production in South Texas**

Authors: Montgomery, SL

Source: AAPG BULLETIN; MAY, 1997, 81 5, p697-p710, 14p.

Subject Terms: **Energy & fuels; engineering, petroleum; geosciences, multidisciplinary**

Abstract: Discovered in 1990 near the southern limit of the upper Wilcox gas-producing trend in south Texas, Bob West field is the largest pool to date in this trend, with probable reserves of up to 1 Tcf. The field produces from seven major sandstone "packages," comprising 27 individual reservoirs and distributed over 3500 productive acres. The sandstones represent either fluvial/deltaic deposits or delta-margin barrier bar and strand-plain sediments. Porosities range up to 20%, but permeabilities are low, commonly less than 1.5 md. Artificial stimulation is therefore required to establish commercial rates of production. Bob West lies on a faulted anticline between two major growth-fault structures, with several stages of structural development evident. Such development has directly affected sandstone thickness. Rates of production are higher at Bob West than at other upper Wilcox fields due to commingling of zones, large-scale fracture treatments, and directional drilling. Discovery at Bob West has significant implications for renewed exploration in this part of the upper Wilcox gas trend.

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Record 67***Subject: energy – gas****Title: Pioneer speeds up South Texas Edwards reef gas play**

Authors:

Source: OIL & GAS JOURNAL; MAR 20, 2006, 104 11, p40-p40, 1p.

Subject Terms: Energy & fuels; engineering, petroleum

Abstract: Pioneer Natural Resources Co., Dallas, is building activity in the Cretaceous Edwards limestone gas trend south and east of San Antonio with a \$ 115 million capital budget in the South Texas resource play in 2006.

Record 68***Subject: energy – gas****Title: Recipe for a Tex-Mex Pipeline Project: Considerations in Permitting a Cross-Border Gas Transportation Project.**

Authors: Culota, Kenneth S.

Source: Texas International Law Journal; Winter2004, Vol. 39 Issue 2, p287-326, 40p, 1 Chart

Subject Terms: Energy policy; gas-law & legislation; gas industry; international economic relations; federal legislation

Abstract: Outlines the basic legal rules and related considerations pertinent to permitting a project to transport gas across the Texas-Mexico border. Historical overview of regulatory approaches in Mexico and the U.S.; Review of relevant U.S. federal laws; Implications of Mexico's energy laws and regulatory system.

Record 69**Subject: energy – gas****Title: Characterization of the sedimentary thermal regime along the Corsair growth-fault zone, Texas continental shelf, using corrected bottomhole temperatures**

Authors: Nagihara, S

Source: AAPG BULLETIN; JUL, 2010, 94 7, p923-p935, 13p.

Subject Terms: Energy & fuel; Gulf-of-Mexico; heat-low; South Texas; salt; basin; Wilcox; rocks; slope; gas

Abstract: Temperatures of deep (> similar to 3 km [1.8 mi]) sediments along the Corsair growth-fault zone in the Texas continental shelf are elevated relative to those off the fault zone. This observation is based on a compilation of nearly 400 bottomhole temperatures (BHTs) obtained from about 230 wells widely distributed across the continental shelf. The BHTs have been individually corrected for the thermal disturbance associated with drill-fluid circulation. The isotherm of 140 degrees C (284 degrees F) derived from the corrected BHTs shows more or less continuous peaks along the fault zone. Thermal gradients in the depth range of 3 to 5 km (1.8 to 3.1 mi) shows higher values along the fault zone than off the fault zone. These trends are similar to the previous observations made along the Wilcox growth-fault zone in the Texas coastal plain. Previous studies suggest that the faults of the Wilcox system serve as the conduits for hot fluids expelled from deep, overpressured sediments. A similar mechanism may explain the elevated temperatures along the Corsair fault zone.

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Record 70**Subject: energy – gas****Title: Conoco buys south Texas Lobo trend assets**

Authors:

Source: OIL & GAS JOURNAL; JUN 9, 1997, 95 23, p25-p25, 1p.

Subject Terms: Energy & fuels; engineering, petroleum

Abstract: "Natural gas development in South Texas stands to advance with disclosure by Conoco Inc. that it will pay \$ 900 million for significant additional gas reserves, production, and assets in the Lobo trend."

Record 71***Subject: energy – biomass energy****Title: Weedy lignocellulosic feedstock and microbial metabolic engineering: advancing the generation of 'Biofuel'.**

Authors: Chandel, Anuj K.; Singh, Om V.

Source: Applied Microbiology & Biotechnology; Mar2011, Vol. 89 Issue 5, p1289-1303, 15p

Subject Terms: Lignocellulose ethanol as fuel; feedstock; biomass energy; plant biomass; hydrolysis

Abstract: Lignocellulosic materials are the most abundant renewable organic resources (~200 billion tons annually) on earth that are readily available for conversion to ethanol and other value-added products, but they have not yet been tapped for the commercial production of fuel ethanol. The lignocellulosic substrates include woody substrates such as hardwood (birch and aspen, etc.) and softwood (spruce and pine, etc.), agro residues (wheat straw, sugarcane bagasse, corn stover, etc.), dedicated energy crops (switch grass, and Miscanthus etc.), weedy materials (Eicchornia crassipes, Lantana camara etc.), and municipal solid waste (food and kitchen waste, etc.). Despite the success achieved in the laboratory, there are limitations to success with lignocellulosic substrates on a commercial scale. The future of lignocellulosics is expected to lie in improvements of plant biomass, metabolic engineering of ethanol, and cellulolytic enzyme-producing microorganisms, fullest exploitation of weed materials, and process integration of the individual steps involved in bioethanol production. Issues related to the chemical composition of various weedy raw substrates for bioethanol formation, including chemical composition-based structural hydrolysis of the substrate, need special attention. This area could be opened up further by exploring genetically modified metabolic engineering routes in weedy materials and in biocatalysts that would make the production of bioethanol more efficient.©

Record 72***Subject: energy – wind power****Title: Evaluating the Impacts of Real-Time Pricing on the Cost and Value of Wind Generation.**

Authors: Sioshansi, Ramteen

Source: IEEE Transactions on Power Systems; May2010, Vol. 25 Issue 2, p741-748, 8p

Subject Terms: Wind power; pricing; electric power; renewable energy sources; wind forecasting

Abstract: One of the costs associated with integrating wind generation into a power system is the cost of redispatching the system in real-time due to day-ahead wind resource

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forecast errors. One possible way of reducing these redispatch costs is to introduce demand response in the form of real-time pricing (RTP), which could allow electricity demand to respond to actual real-time wind resource availability using price signals. A day-ahead unit commitment model with day-ahead wind forecasts and a real-time dispatch model with actual wind resource availability is used to estimate system operations in a high wind penetration scenario. System operations are compared to a perfect foresight benchmark, in which actual wind resource availability is known day-ahead. The results show that wind integration costs with fixed demands can be high, both due to real-time redispatch costs and lost load. It is demonstrated that introducing RTP can reduce redispatch costs and eliminate loss of load events. Finally, social surplus with wind generation and RTP is compared to a system with neither and the results demonstrate that introducing wind and RTP into a market can result in superadditive surplus gains.©

Record 73*

Subject: energy – wind power

Title: Economics of compressed air energy storage to integrate wind power: A case study in ERCOT

Authors: Emily Fertig; Jay Apt

Source: In Energy Policy 39(5):2330-2342

Subject Terms: **Wind power; Electric Reliability Council of Texas; compressed air energy storage**

Abstract: Compressed air energy storage (CAES) could be paired with a wind farm to provide firm, dispatchable baseload power, or serve as a peaking plant and capture upswings in electricity prices. We present a firm-level engineering-economic analysis of a wind/CAES system with a wind farm in central Texas, load in either Dallas or Houston, and a CAES plant whose location is profit-optimized. With 2008 hourly prices and load in Houston, the economically optimal CAES expander capacity is unrealistically large – 24GW – and dispatches for only a few hours per week when prices are highest; a price cap and capacity payment likewise results in a large (17GW) profit-maximizing CAES expander. Under all other scenarios considered the CAES plant is unprofitable. Using 2008 data, a baseload wind/CAES system is less profitable than a natural gas combined cycle (NGCC) plant at carbon prices less than \$56/tCO₂ (\$15/MMBTU gas) to \$230/tCO₂ (\$5/MMBTU gas). Entering regulation markets raises profit only slightly. Social benefits of CAES paired with wind include avoided construction of new generation capacity, improved air quality during peak times, and increased economic surplus, but may not outweigh the private cost of the CAES system nor justify a subsidy.

Record 74*

Subject: energy – uranium

Title: Speciation of Uranium in a South Texas Lignite – Additional Evidence for a Mixed-Mode of Occurrence

Authors: MOHAN, MS; ILGER, JD; ZINGARO, RA

Source: ENERGY & FUELS; JUL-AUG, 1991, 5 4, p568-p573, 6p.

Subject Terms: **Energy & fuels; engineering, chemical; humic-acid**

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Abstract: New experimental evidence indicates that uranium in a Jackson lignite (Karnes County, South Texas) occurs principally (70-90%) in the form of uranyl humates and the rest in the form of poorly crystallized mineral(s). The low-temperature ash (LTA) of the lignite was separated by density gradient fractionation. Examination of the fractions by scanning electron microscopy-energy-dispersive X-ray spectrometry showed the presence of grains (10-30- μ m) of uranium minerals only in the highest density (> 2.90 g/mL) fraction. The X-ray spectral data indicate that the uraniferous grains are composites of coffinite (U(SiO₄)_{1-x}(OH)_{4-x}) and possibly its alteration product uraninite (UO₂). Minor amounts of autunite (Ca(UO₂)₂(PO₄)₂·10-12H₂O) also appear to be present. Much of the uranium (approximately 90%) which is extremely fine-grained is recovered in the lower density fractions and probably originates from the destruction of uranyl humates during the ashing. Extractions of the ground lignite with HCl solutions of varying pH (0.7-3.0) have been carried out. The experimentally obtained uranium extraction efficiencies were compared with corresponding values calculated assuming a predominantly humic mode of occurrence for uranium. If suitable simplifications are made, the agreement is quite good.

Record 75*

Subject: energy – thermal energy

Title: Geothermal power production from abandoned oil wells.

Authors: Davis, Adelina P.; Michaelides, Efstathios E.

Source: Energy; Jul2009, Vol. 34 Issue 7, p866-872, 7p

Subject Terms: GEO thermal power plants; GEO thermal resources; oil wells; simulation methods; working fluids; temperature effect; force & energy; electric power production

Abstract: A simulation for the determination of geothermal power production from abandoned oil wells by injecting and retrieving a secondary fluid was performed. The analysis takes into consideration local geothermal gradients and typical well depths and pipe diameters. Isobutane is chosen as the secondary fluid, which is injected in the well at moderate pressures and allowed to heat up and produce vapor. The computational model that was developed takes into account mass, energy, and momentum conservation equations for the well flow, and the simulation helps determine the state of the fluid from injection to retrieval. It is observed that the operation of such systems attains a maximum power that depends on the temperature of the well bottom and the injection pressure. In general, 2–3MW of electric power may be produced from wells that are typical in the South Texas region. ©

Record 76

Subject: energy – thermal energy

Title: Thermal conductivity of Wilcox and Frio sandstones in south Texas (Gulf of Mexico basin)

Authors: McKenna, TE; Sharp, JM; Lynch, FL

Source: AAPG BULLETIN; AUG, 1996, 80 8, p1203-p1215, 13p

Subject Terms: Energy & fuels; engineering, petroleum; geosciences, multidisciplinary; temperature; sedimentary basins; hydrocarbon generation; well logs

Abstract: Thermal conductivity and petrographic data are presented for verifying mechanistic

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models of sandstone thermal conductivity. We measured the thermal conductivity of 83 Wilcox and Frio sandstones from south Texas in the Gulf of Mexico sedimentary basin, and correlated conductivity to petrographic variables. Thermal conductivities of water-saturated sandstones at 20 degrees C (68 degrees F) and 3 MPa (435 psi) were measured on core plugs using a divided-bar apparatus. Thermal conductivity ranges from 2.06 to 5.73 W/m/K over a porosity range of 2.4 to 29.6%. Because of a higher quartz content, Wilcox sandstones at a given porosity are more conductive than Frio sandstones. A grain-matrix conductivity of 5.9 W/m/K is estimated for Wilcox sandstones; matrix conductivity is adequately described with an arithmetic mixing model. Thermal conductivities of clean (<25% clay) sandstones can be described by a multilinear function of decreasing thermal conductivity with increasing porosity and increasing thermal conductivity with quartz content. For clean, quartzose (>35% of the solids) sandstones, the dependence on quartz content can be dropped and thermal conductivities can be predicted with a linear decrease in conductivity with increasing porosity. These sandstones appear isotropic with respect to thermal conductivity.

Record 77

Subject: energy – electronic power

Title: South Texas baffled by leaks

Authors:

Source: POWER; JUN, 2003, 147 5, p8-p8, 1p.

Subject Terms: Energy & fuels

Abstract: “Managers of the South Texas Project Electric Generating Station (STPEGS) still don't know what caused the leak in Unit 1's reactor that shut it down in late March. At that time, a routine inspection turned up two tiny (no bigger than an aspirin) boric acid deposits on the underside of its pressurized reactor vessel (Figure 3). Boric acid, used to absorb extra neutrons, is highly corrosive in open air and can quickly eat through metal.”

Record 78*

Subject: energy – review

Title: Unconventional Energy Resources: 2011 Review.

Authors:

Source: Natural Resources Research; Dec2011, Vol. 20 Issue 4, p279-328, 50p

Subject Terms: Energy development; gas hydrates; coalbed methane; coal; uranium

Abstract: This report contains nine unconventional energy resource commodity summaries prepared by committees of the Energy Minerals Division (EMD) of the American Association of Petroleum Geologists. Unconventional energy resources, as used in this report, are those energy resources that do not occur in discrete oil or gas reservoirs held in structural or stratigraphic traps in sedimentary basins. These resources include coal, coalbed methane, gas hydrates, tight gas sands, gas shale and shale oil, geothermal resources, oil sands, oil shale, and uranium resources. Current U.S. and global research and development activities are summarized for each unconventional energy commodity in the topical sections of this report. Coal and uranium are

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expected to supply a significant portion of the world's energy mix in coming years. Coalbed methane continues to supply about 9% of the U.S. gas production and exploration is expanding in other countries. Recently, natural gas produced from shale and low-permeability (tight) sandstone has made a significant contribution to the energy supply of the United States and is an increasing target for exploration around the world. In addition, oil from shale and heavy oil from sandstone are a new exploration focus in many areas (including the Green River area of Wyoming and northern Alberta). In recent years, research in the areas of geothermal energy sources and gas hydrates has continued to advance. Reviews of the current research and the stages of development of these unconventional energy resources are described in the various sections of this report.©

Record 79*

Subject: energy – marine energy

Title: **A comparison of offshore wind power development in Europe and the U.S.: Patterns and drivers of development**

Authors: Brian Snyder; Mark J. Kaiser

Source: Applied Energy 86(10):1845-1856

Subject Terms: **Offshore wind power; minerals management Service; marine energy**

Abstract: Since the turn of the 21st century, the onshore wind industry has seen significant growth due to the falling cost of wind generated electricity. This growth has coincided with an interest in the development of offshore wind farms. In Europe, governments and developers have begun establishing small to medium sized wind farms offshore to take advantage of stronger and more constant winds and the relative lack of landowner conflicts. In the U.S., several developers are in the planning and resource evaluation phases of offshore wind farm development, but no wind farms are currently operational or under construction. In this paper, we analyze the patterns of development in Europe and compare them to the U.S. We find significant differences in the patterns of development in Europe and the U.S. which may impact the viability of the industry in the U.S. We also discuss the policies used by European nations to stimulate offshore wind development and we discuss the potential impacts of similar policies in the U.S.

Record 80*

Subject: energy – renewable energy

Title: **A unit commitment study of the application of energy storage toward the integration of renewable generation.**

Authors: Harris, Chioke; Meyers, Jeremy P.; Webber, Michael E.

Source: Journal of Renewable & Sustainable Energy; Jan2012, Vol. 4 Issue 1, p013120, 20p, 14 Charts, 5 Graphs

Subject Terms: **Energy storage; electric generators; renewable energy sources; power resources; electrochemical apparatus; operating costs**

Abstract: To examine the potential benefits of energy storage in the electric grid, a generalized unit commitment model of thermal generating units and energy storage facilities is developed. Three different storage scenarios were tested-two without limits to total storage assignment and one with a constrained maximum storage portfolio. Given a

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generation fleet based on the City of Austin's renewable energy deployment plans, results from the unlimited energy storage deployment scenarios studied show that if capital costs are ignored, large quantities of seasonal storage are preferred. This operational approach enables storage of plentiful wind generation during winter months that can then be dispatched during high cost peak periods in the summer. These two scenarios yielded \$70 million and \$94 million in yearly operational cost savings but would cost hundreds of billions to implement. Conversely, yearly cost reductions of \$40 million can be achieved with one compressed air energy storage facility and a small set of electrochemical storage devices totaling 13 GWh of capacity. Similarly sized storage fleets with capital costs, service lifetimes, and financing consistent with these operational cost savings can yield significant operational benefit by avoiding dispatch of expensive peaking generators and improving utilization of renewable generation throughout the year. Further study using a modified unit commitment model can help to clarify optimal storage portfolios, reveal appropriate market participation approaches, and determine the optimal siting of storage within the grid. ©

Record 81*

Subject: energy – renewable energy

Title: Fuel for Thought 19.1 (mid-August to mid-November 2008).

Authors:

Source: Energy & Environment; 2008, Vol. 19 Issue 1, p101-202, 102p

Subject Terms: Environmentalism; energy policy; energy development; reviewable energy sources; energy consumption; green business; green movement; green products

Abstract: The article provides information related to climate change, environmental issues and energy politics worldwide. The increase in global primary energy consumption has declined to 2.5 percent from 3.2 percent in 2005. A conference focusing on renewable energy finance will be held in 2007 in India. Former U.S. vice president Albert Gore has joined Silicon Valley venture capital firm, where he will establish green businesses and technologies. Carbon emissions trading schemes have launched a partnership to collaborate on design issues and help build a global carbon market.

Record 82*

Subject: energy – energy policy

Title: Energy sources, public policy, and public preferences: Analysis of US national and site-specific data

Authors: Michael Greenberg

Source: Energy Policy 37(8):3242-3249

Subject Terms: Energy sources; preferences; surveys

Abstract: To understand public preferences for energy sources, 2701 US residents were surveyed; 2101 of the respondents lived within 50 miles of a major nuclear facility. Over 90% wanted greater reliance on solar and wind, and over 70% wanted more reliance upon hydroelectric sources. Less than one-third wanted more use of oil and coal. Nuclear and natural gas sources were closer to an even split. Notably, those who lived near nuclear facilities favored the same sources, although a larger proportion of

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these respondents favored increasing use of nuclear power than in the national sample. These results are consistent with other United States surveys. The study found striking differences in preferences by age, ethnicity/race and other demographic characteristics that need in-depth investigation in order to help decision-makers and everyone else better understand public preferences about energy policy choices.

Record 83

Subject: energy – energy policy

Title: **Fuel for Thought Facts and Wishful Thinking Climate Politics and Policy – Bali General Energy Issues and Carbon Fuels Emission Policy Transport and Carbon Finance Technology and INNOVATION Climate Science Debated IPCC Critique and Uses Nuclear...**

Authors:

Source: Energy & Environment; 2008, Vol. 19 Issue 2, p325-369, 45p

Subject Terms: **Climatic changes; greenhouse gases; oil consumption; energy consumption; economic policy; energy policy**

Abstract: The article presents a retrospective summary of events related to energy policies and technology, emission policy and climatic change. The United Nations held a meeting on climate change in Bali, Indonesia wherein 187 countries agreed on how to reduce greenhouse gas emissions deeply by 2012. The China and India together account for about 70% of the increase in oil consumption over last 2 years. According to Morgan Stanley the world market for clean energy could reach \$500 billion by 2020 and \$1 trillion by 2030.

Record 84*

Subject: energy – energy policy

Title: **Mexico's Gas Import Tariff: Roadblock to Investments and Recovery.**

Authors: Baker, George

Source: Natural Gas (Wiley); May1997, Vol. 13 Issue 10, p16-18, 3p

Subject Terms: **Tariff; individual investors; energy policy; petroleum products; natural gas**

Abstract: Focuses on the disadvantages of the imposed 6-percent tariff on natural gas imports on the effort of the Mexico government to attract private investment in electric power generation and natural gas distribution. Impact on the viability of the country's energy policy; Market competition in natural gas transportation and distribution; Indication of additional pass-through cost on gas imported by a private company.

Record 85*

Subject: energy – energy conservation

Title: **Attitudes Toward Energy Conservation: A Confirmatory Factor Analysis.**

Authors: Samuelson, Charles D.; Biek, Michael

Source: Journal of Applied Social Psychology; 4/1/91, Vol. 21 Issue 7, p549-568, 20p, 5 Charts

Subject Terms: **Energy conservation; Consumers attitudes; Energy Consumption; Factor analysis ; Telephone surveys**

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Abstract: This study reports a large-scale survey of citizens' attitudes and beliefs toward energy use and conservation in the southwestern United States. A probability sample of 1,000 Texas residents responded to a 10-item telephone survey. Questions concerned issues such as thermal comfort and health, economic benefits of conservation, efficacy of individual efforts, and perceived causes of the current U.S. energy situation. Confirmatory factor analysis replicated previous work by Seligman et al. (1979) and Becker et al. (1981) by identifying the same four principal dimensions underlying energy use attitudes and beliefs: 1) comfort and health, 2) high effort-low payoff, 3) role of individual consumer, and 4) legitimacy of energy problem. In addition, several demographic characteristics were found to moderate consumers' responses to the survey items. The results of this study reinforce the conclusion that future energy conservation campaigns should be sensitive to consumers' concerns about comfort and health. New directions for future research on energy attitudes and conservation behavior are discussed. ©

Record 86*

Subject: energy – energy conservation

Title: **An Applied Local Sustainable Energy Model: The Case of Austin, Texas.**

Authors: Hughes, Kristen

Source: Bulletin of Science, Technology & Society; Apr2009, Vol. 29 Issue 2, p108-123, 16p, 2 Graphs

Subject Terms: **sustainable development; sustainable urban development; environmental engineering; climatic changes; renewable energy sources; socioeconomics; energy economics; alternative fuels; energy conservation**

Abstract: Climate change is only one factor driving growing numbers of cities throughout the globe to reconsider conventional approaches to electricity generation and use. In the U.S., this momentum is incorporating a shift away from centralized, supply-side approaches reliant on fossil fuels and nuclear power, toward more distributed, flexible, and cleaner energy systems. In this regard, such systems entail elements of the emerging Sustainable Energy Utility (SEU) model enacted by the U.S. state of Delaware in 2007. The potential value of this model can be explored by examining those locales where elements of energy service compatible with an SEU have currently been adopted and implemented. This paper looks to one such community, Austin, Texas, to assess its utilization of an alternative energy pathway and the outcomes observed to date. Considered here are the technical, economic, and environmental dimensions of change, as well as the social dynamics accompanying new imperatives for energy development. ©

Record 87*

Subject: energy – coal

Title: **Petrography and geochemistry of the San Miguel lignite, Jackson Group (Eocene), south Texas.**

Authors: Peter D. Warwick; Sharon S. Crowley; Leslie F. Ruppert; James Pontolillo

Source: The Society for Organic Petrology , Organic Geochemistry 24(2):197-217

Subject Terms: **Coal petrography; volcanic ash; coal geochemistry; Eocene lignite; trace elements**

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Abstract: The San Miguel lignite deposit (late Eocene, lower Jackson Group) of south Texas consists of four or more thin (generally < 1 m thick) lignite benches that are separated by claystone and mudstone partings. The partings are composed of altered volcanic air-fall ash that has been reworked by tidal or channel processes associated with a back-barrier depositional environment. The purpose of this study is to examine the relationship between the ash yield and the petrographic and geochemical characteristics of the San Miguel lignite as mined. Particular attention is given to 12 of the environmentally sensitive trace elements (As, Be, Cd, Cr, Co, Hg, Mn, Ni, Pb, Sb, Se, and U) that have been identified as possible hazardous air pollutants (HAPs) by the United States Clean Air Act Amendments of 1990. A total of 29 rock and lignite samples were collected and characterized by geochemical and petrographic methods. The major conclusions of the study are as follows: (1) The distribution of Mn is inversely related to the ash yield of the lignite samples. This indicates an organic affinity, or an association with finely disseminated minerals in the lignite that contain this element. (2) On a whole-coal basis, the concentration of the HAPs' element Pb is positively related to ash yield in lignite samples. This indicates an inorganic affinity for Pb. (3) Average whole-coal concentrations of As, Be, Sb, and U in the San Miguel samples are greater than published averages for these elements in other U.S. lignites. (4) The upper and lower lignite benches of the San Miguel deposit are both ash- and algal-rich, indicating that these intervals were probably deposited in wetter conditions than those in which the middle intervals formed. (5) The dominance of the eugelinite maceral subgroup over the huminite subgroup indicates that the San Miguel lignites were subjected to peat-forming conditions (either biogenic or chemical) that enabled degradation of wood cellular material into matrix gels, or that the plants that formed these lignite benches were less woody and more prone to formation of matrix gels. (6) An inertinite-rich layer (top of the B bed) might have formed from widespread oxidation of the San Miguel peat as a result of a volcanic ash fall which was subsequently reworked.

Record 88*

Subject: energy – coal

Title: Soil microbial respiration as a tool to assess post mine reclamation.

Authors: Haney, R. L.; Hossner, L. R.; Haney, E. B.

Source: International Journal of Mining, Reclamation & Environment; Mar2008, Vol. 22 Issue 1, p48-59, 12p, 3 Charts, 6 Graphs, 1 Map

Subject Terms: Coal mines & mining; energy industries; mineral industries; mining corporations

Abstract: An evaluation of soil quality, which integrates biological, chemical and physical processes, would be beneficial to regulators as well as mining companies when making reclamation decisions. Coal mining regulations require that industry perform soil sampling and submit laboratory results in order to determine pre-mine and reclaimed soil quality. A rapid and accurate biological soil quality method, such as one-day CO₂ (1-day CO₂) analysis, can be used to determine soil microbial activity which is related to the soils' ability to sustain nutrient cycling. Our objective in this study was to compare native and reclaimed soils from surface-mine operations in order to assess the effectiveness of the 1-day CO₂ method as a tool for determining biological soil quality. Soil samples were taken from sites that visually had poor and

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well-vegetated reclaimed areas of a surface-mine operation as well as an undisturbed native site. Chemical, physical and biological indicators were compared to 1-day CO₂ analysis for microbial activity. Results indicate that the biological soil quality indicators as summarized by 1-day CO₂ analysis are a more sensitive indicator of soil health on the reclaimed soils tested than chemical analysis alone. One-day CO₂ analysis can be a useful additional tool for regulators and mining companies when assessing the soils ability to sustain plant growth and evaluate reclamation success. ©

Record 89*

Subject: energy – energy hierarchy

Title: Concepts and methods of ecological engineering

Authors: Howard T Odum; B Odum

Source: The Philosophy and Emergence of Ecological Engineering , Ecological Engineering 20(5):339-361

Subject Terms: Ecological engineering; waste recycle; energy hierarchy; Maximum power

Abstract: Ecological engineering was defined as the practice of joining the economy of society to the environment symbiotically by fitting technological design with ecological self design. The boundary of ecological engineering systems includes the ecosystems that self organize to fit with technology, whereas environmental engineering designs normally stop at the end of the pipe. For example, the coastal marsh wildlife sanctuary at Port Aransas, Texas, developed when municipal wastewaters were released on bare sands. The energy hierarchy concept provides principles for planning spatial and temporal organization that can be sustained. Techniques of ecological engineering are given with examples that include maintaining biodiversity with multiple seeding, experimental mesocosms, enclosed systems with people like Biosphere 2, wetland filtration of heavy metals, overgrowth and climax ecosystems, longitudinal succession, exotics, domestication of ecosystems, closing material cycles, and controlling water with vegetation reflectance.

Record 90*

Subject: water – law & legislation

Title: The History of W.A. East V. Houston and Texas Central Railway Company, 1904: Establishment of The Rule of Capture in Texas Water law or “He Who Has The Biggest Pump Gets The Water”.

Authors: Porter, Jr., Charles R.

Source: East Texas Historical Journal; Fall2012, Vol. 50 Issue 2, p107-119, 13p

Subject Terms: Water law & legislation; water supply; groundwater; water pumps; droughts; water conservation; rule of capture (Natural resources)

Abstract: The article discusses the development of the rule of capture principle within Texas' water law, which deals with ownership of the state's underground water supply, through an examination of the 1904 legal dispute between landowner W. A. East and the Houston and Texas Central Railway (H & TC), who drilled a large well on East's property. The rule of capture gave essentially gave ownership rights to whoever was better able to pump underground water. The author goes on to explain the negative ecological effects of the principle, such as droughts and the drying of Texas'

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Comanche Springs. Water conservation efforts are also explained.

Record 91*

Subject: water – water harvesting

Title: A literature based study of stormwater harvesting as a new water resource.

Authors: Hamdan, Sami M.

Source: Water Science & Technology; 2009, Vol. 60 Issue 5, p1327-1339, 13p, 2 Color Photographs, 7 Charts

Subject Terms: Water harvesting; water conservation; groundwater; water supply; water quality

Abstract: Rainwater harvesting is an important new water resource that participates in bridging the deficit in the water resources in water scarce countries. It is not a new technology but it has been practiced in many countries for many years. From a quantitative point of view it makes a positive contribution to the water resources balance. However, the quality of this new water resource was under the subject of this study in addition to the historical and international experiences carried out in stormwater management. Rainwater harvested from rooftops was noted to be much cleaner than that coming from urban stormwater runoff. The water quality parameters in stormwater were examined with a focus on heavy metals such as Cd, Zn, Pb and Cu which are released in low pH values. Fortunately, heavy metals like other ionic bounds and metal oxide bounds are removed by precipitation or co-precipitation at high values of pH. ©

Record 92*

Subject: water – fresh water

Title: Movement and Microhabitat Associations of Guadalupe Bass in Two Texas Rivers

Authors: Perkin, JS; Shattuck, ZR; Bean, PT; Bonner, TH; Saraeva, E; Hardy, TB

Source: NORTH AMERICAN JOURNAL OF FISHERIES MANAGEMENT; FEB, 2010, 30 1, p33-p46, 14p.

Subject Terms: Conservation status; habitat use; fresh water

Abstract: The Guadalupe bass *Micropterus treculii* is endemic to Texas and is threatened by introgression with introduced smallmouth bass *M. dolomieu* as well as habitat degradation. This study described and quantified the movements and habitat associations of Guadalupe bass to assess the factors that may influence current populations. Radio-tagged adult Guadalupe bass were tracked in the Pedernales River (n = 12) and South Llano River (n = 12) from January through August 2008. Available microhabitats were measured and modeled in terms of depth, velocity, substrate, and cover for about 1.5 km in the Pedernales River and 1.2 km in the South Llano River. Rates of movement were greatest during the reproductive season, ranging from less than 1 to 9 m/d. Instream cover (such as undercut banks and woody debris) was preferred during daylight hours throughout the study period, although the distances from cover increased from January to August. Habitat shifts from cover to open water occurred at night and from woody structures to boulders and ledges during a large flood pulse. The habitats most suitable for adult Guadalupe bass had a depth of 1.0 m and a current velocity of 0.05 m/s, and habitat selection was strongest for eddy mesohabitats with smaller substrates. By July, the Guadalupe bass in the South Llano River were associated with runs with greater current velocities, whereas those in the

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Pedernales River were associated with pools with greater depths, largely owing to the low flows and reduced habitat availability in the Pedernales River. Environmental factors, including the availability and suitability of instream cover, are probably the strongest influences on the distribution and abundance of Guadalupe bass.

Record 93*

Subject: water – hydrodynamics

Title: Influence of Vessel Passages on Tidal Creek Hydrodynamics at Aransas National Wildlife Refuge (Texas, United States): Implications on Materials Exchange.

Authors: Davis, III, Stephen E.; Allison, John Bryan; Driffill, Matthew J.; Zhang, Saijin

Source: Journal of Coastal Research; Mar2009, Vol. 25 Issue 2, p359-365, 7p, 1 Chart, 4 Graphs, 1 Map

Subject Terms: **Hydrodynamics; tide; environmental aspects; water levels; wildlife conservation; whooping crane; marine sediments; water ways**

Abstract: The impact of commercial vessels on coastal hydrodynamics and sediment movement has been measured and simulated in shipping channels and rivers. However, little empirical data exist on the temporal variation in vessel-generated forces in addition to the ecological implications for natural waterways such as tidal creeks and bayous. Along the U.S. Gulf of Mexico coast, these ecosystems may be highly susceptible to unnatural currents created by commercial vessel traffic. We sought to characterize and quantify the impact of large vessel traffic in the Gulf Intracoastal Waterway (GIWW) on tidal creek hydrodynamics at Aransas Wildlife Refuge (ANWR). Creek water level was monitored at 1-minute intervals in three different tidal creeks at ANWR during the summer of 2004. We also conducted preliminary measurements of bedload sediment flux associated with vessel passages. Vessel-induced fluctuations in water level in at least one site were the equivalent or greater than the diurnal tidal range (about 0.1 m) and were driven by distance to the GIWW, presence of islands as barriers, and baywide water levels that affected the attenuation of drawdown currents across a shallow bay. Bedload sediment flux during barge-induced outflow (mean = 9.3 g dry weight [dw] min⁻¹) was nearly twice the mean measured during normal ebb outflow (5 g dw min⁻¹). Our results identify a potentially important factor that may affect the long-term sustainability of the marsh and tidal creek systems at ANWR, which serve as wintering habitat to the endangered whooping crane (*Grus americana* L.). ©

Record 94

Subject: water – environmental hydraulics

Title: Hydrologic Footprint Residence: Environmentally Friendly Criteria for Best Management Practices.

Authors: Giacomoni, Marcio H.; Zechman, Emily M.; Brumbelow, Kelly

Source: Journal of Hydrologic Engineering; Jan2012, Vol. 17 Issue 1, p99-108, 10p, 3 Charts, 9 Graphs, 2 Maps

Subject Terms: **Environmental hydraulics; ecological impact; watershed management; urbanization -- environmental aspects; sustainable development; floods – research; watersheds -- Texas**

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Abstract: The natural hydrologic flow regime is altered by urbanization, which can be mitigated through best management practices (BMPs) or low impact development (LID). Typically, the effectiveness of different management scenarios is tested by comparing post- and predevelopment instantaneous peak flows. This approach, however, does not capture the extent of hydrologic change and the effect on downstream communities. A new hydrologic sustainability metric is presented here to quantify the impact of urbanization on downstream water bodies on the basis of the inundation dynamics of the flow regime. The hydrologic footprint residence (HFR) is designed to capture both temporal and spatial hydrological changes to an event-based flow regime by calculating the inundated areas and duration of a flood. The HFR is demonstrated for a hypothetical watershed and a watershed on the Texas A&M University Campus, located in College Station, Texas. For the campus watershed, three design storms (2-, 10-, and 100-year) and a set of historical events (during the period 1978-2009) are simulated for various management scenarios, representing predevelopment conditions, development on campus, BMP-based control, and LID-based control. The results indicate that the HFR can better capture alterations to the shape of the hydrograph compared with the use of the peak flow only.©

Record 95*

Subject: water – water conservation

Title: **Hispanic Farmers and Ranchers in the Soil and Water Conservation Movement in South Texas, 1940s to Present.**

Authors: Alonzo, Armando C.

Source: Agricultural History; Spring2004, Vol. 78 Issue 2, p201-221, 21p, 4 Charts

Subject Terms: **Conservation of natural resources; environmental protection; flood control; sustainable development; water conservation; ranching**

Abstract: One of five articles in this issue of 'Agricultural History' from the 2003 Agricultural History Society symposium on the Greater Southwest. Presents the history of resource conservation efforts in South Texas during the 20th century. During the Great Depression, the Soil Conservation Service and the Civilian Conservation Corps built projects that controlled soil erosion, and the Agricultural Stabilization and Conservation Service emphasized farming practices that conserved the soil. After World War II, many Hispanic farmers adopted conservation practices to preserve the value and productivity of their lands, but efforts to convince ranchers to control their herds' grazing met with resistance. For their part, the federal and state governments helped farmers by building dams to help with flood control and provide a steady supply of water. Ranching started to decline in the late 20th century as wealthy, urban professionals increasingly bought ranchland for recreational purposes.©

Record 96*

Subject: water – water conservation

Title: **Barriers to Water Conservation in The RIO Grande Basin**

Authors: Ward, Frank A.1; Michelsen, Ari M.; DeMouche, Leeann

Source: Journal of the American Water Resources Association; Feb2007, Vol. 43 Issue 1, p237-253, 17p, 5 Charts, 1 Map

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Subject Terms: **Water conservation; watersheds; water resue; conservation of natural resources; water Utilities; water transfer**

Abstract: The Rio Grande basin shares problems faced by many arid regions of the world: growing and competing demands for water and river flows and uses that are vulnerable to drought and climate change. In recent years legislation, administrative action, and other measures have emerged to encourage private investment in efficient agricultural water use. Nevertheless, several institutional barriers discourage irrigators from investing in water conservation measures. This article examines barriers to agricultural water conservation in the Rio Grande basin and identifies challenges and opportunities for promoting it. Several barriers to water conservation are identified: clouded titles, water transfer restrictions, illusory water savings, insecure rights to conserved water, shared carry-over storage, interstate compacts, conservation attitudes, land tenure arrangements, and an uncertain duty of water. Based on data on water use and crop production costs, price is found to be a major factor influencing water conservation. A low water price discourages water conservation even if other institutions promote it. A high price of water encourages conservation even in the presence of other discouraging factors. In conclusion, water-conserving policies can be more effectively implemented where water institutions and programs are designed to be compatible with water's underlying economic scarcity. ©

Record 97*

Subject: water – water conservation

Title: **The challenge of documenting water quality benefits of conservation practices: a review of USDA-ARS's conservation effects assessment project watershed studies.**

Authors: Tomer, M. D.; Locke, M. A.

Source: Journal of Agricultural Science & Technology B; Jul2011, Vol. 1 Issue 7b, p300-310, 11p, 1 Chart, 1 Map

Subject Terms: **Water conservation; water supply; qater quality management; watersheds; sewage disposal; soil erosion**

Abstract: The Conservation Effects Assessment Project was established to quantify water quality benefits of conservation practices supported by the U.S. Department of Agriculture (USDA). In 2004, watershed assessment studies were begun in fourteen agricultural watersheds with varying cropping systems, landscapes, climate, and water quality concerns. This paper reviews USDA Agricultural Research Service 'Benchmark' watershed studies and the challenge of identifying water quality benefits in watersheds. Study goals included modeling and field research to assess practices, and evaluation of practice placement in watersheds. Not all goals were met within five years but important lessons were learned. While practices improved water quality, problems persisted in larger watersheds. This dissociation between practice-focused and watershed-scale assessments occurred because: (1) Conservation practices were not targeted at critical sources/pathways of contaminants; (2) Sediment in streams originated more from channel and bank erosion than from soil erosion; (3) Timing lags, historical legacies, and shifting climate combined to mask effects of practice implementation; and (4) Water quality management strategies addressed single contaminants with little regard for trade-offs among contaminants. These lessons could help improve conservation strategies and set water quality goals with realistic timelines. Continued research on agricultural water quality could better integrate

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modeling and monitoring capabilities, and address ecosystem services.©

Record 98*

Subject: water – conservation

Title: Developing Objective Operational Definitions for Monitoring Drought.

Authors: Quiring, Steven M.

Source: Journal of Applied Meteorology & Climatology; Jun2009, Vol. 48 Issue 6, p1217-1229, 13p, 11 Charts, 2 Graphs, 2 Maps

Subject Terms: Drought forecasting; operational definitions; water conservation; precipitation; droughts

Abstract: Drought is a complex phenomenon that is difficult to accurately describe because its definition is both spatially variant and context dependent. Decision makers in local, state, and federal agencies commonly use operational drought definitions that are based on specific drought index thresholds to trigger water conservation measures and determine levels of drought assistance. Unfortunately, many state drought plans utilize operational drought definitions that are derived subjectively and therefore may not be appropriate for triggering drought responses. This paper presents an objective methodology for establishing operational drought definitions. The advantages of this methodology are demonstrated by calculating meteorological drought thresholds for the Palmer drought severity index, the standardized precipitation index, and percent of normal precipitation using both station and climate division data from Texas. Results indicate that using subjectively derived operational drought definitions may lead to over- or underestimating true drought severity. Therefore, it is more appropriate to use an objective location-specific method for defining operational drought thresholds.©

Record 99*

Subject: water – water conservation

Title: Is Denser Greener? An Evaluation of Higher Density Development as an Urban Stormwater-Quality Best Management Practice.

Authors: Jacob, John S.; Lopez, Ricardo

Source: Journal of the American Water Resources Association; Jun2009, Vol. 45 Issue 3, p687-701, 15p

Subject Terms: Water pollution; stormwater infiltration; water quality management; pollution prevention; water supply; water conservation

Abstract: A simple spreadsheet model was used to evaluate potential water quality benefits of high-density development. The question was whether the reduced land consumed by higher density development (vs. standard suburban developments) would offset the worse water quality generated by a greater amount of impervious surface in the smaller area. Total runoff volume and per acre loadings of total phosphorous, total nitrogen, and total suspended solids increased with density as expected, but per capita loadings and runoff decreased markedly with density. For a constant or given population, then, higher density can result in dramatically lower total loadings than more diffuse suburban densities. The model showed that a simple doubling of standard suburban densities [to 8 dwelling units per acre (DUA) from about 3 to 5 DUA] in most cases could do more to reduce contaminant loadings associated with

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urban growth than many traditional stormwater best management practices (BMPs), and that higher densities such as those associated with transit-oriented development could outperform almost all traditional BMPs, in terms of reduced loadings per a constant population. Because higher density is associated with vibrant urban life, building a better city may be the best BMP to mitigate the water quality damage that will accompany the massive urban growth expected for the next several decades.©

Record 100*

Subject: water – water conservation

Title: Groundwater Supply in Texas: Private Land Considerations in a Rule-of-Capture State.

Authors: Wagner, Matthew W.; Kreuter, Urs P.

Source: Society & Natural Resources; Apr2004, Vol. 17 Issue 4, p359-367, 9p

Subject Terms: Groundwater; water supply; water use; water conservation

Abstract: Texas is a top water-consuming state in the United States and is increasingly relying on groundwater. Groundwater markets are attracting greater attention as a mechanism for transferring water from rural to urban areas. However, excessive extraction is being exacerbated by the "rule-of-capture" that governs the use of groundwater in Texas combined with widespread subdivision of land. Overexploitation of common-pool resources is not inevitable. A cooperative approach to groundwater management could reduce the negative economic impacts of water transfers in the area of origin and provide landowner incentives to regulate extraction. Landowner associations, monitored by local groundwater conservation districts, offer an instructive model for sustainably managing groundwater while at the same reallocating water resources from rural to municipal uses.©

Record 101*

Subject: water – water conservation

Title: Tracking U.S. Groundwater

Authors: Alley, William M.

Source: Environment, Apr2006, Vol. 48 Issue 3, p10-25, 16p, 5 Color Photographs, 7 Diagrams, 1 Chart

Subject Terms: Groundwater; water supply; water pollution; water conservation

Abstract: The article discusses American groundwater reserves, which can be depleted, though are largely renewable. Groundwater is distributed in various aquifer systems placed under the care of local authorities. Groundwater level changes, recharge and discharge flows, human use, pollution and many other aspects of groundwater supply are discussed in detail. Diagrams, maps and charts illustrate groundwater phenomena.

Record 102*

Subject: water – water conservation

Title: A review of residential water conservation tool performance and influences on implementation effectiveness.

Authors: Inman, David; Jeffrey, Paul1

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Source: Urban Water Journal; Jul2006, Vol. 3 Issue 3, p127-143, 17p, 7 Charts, 2 Graphs

Subject Terms: **Water conservation; conservation of natural resources**

Abstract: Water scarcity and household water consumption has received increasing attention on national public agendas in recent years. At the same time a number of important demand-side management (DSM) studies have been reported on by non-academic institutions, and there is a need for a comprehensive, up to date review of the impacts of DSM tools and the factors which influence their effectiveness. This paper aims to address an apparent lack of coverage in the academic literature by presenting a review of residential DSM tools using reports of recent DSM campaigns in the western (developed) world. The central objectives are to understand the potential for residential DSM tools to save water in different types of household under varying conditions and to identify influences on implementation effectiveness. In the discussion, we explore causes of uncertainty in DSM planning including the non-transferability of trends and existing methods of evaluation, and describe some of the resulting problems. The conclusions offer recommendations as to areas that require, and offer the greatest scope, for future research. This review article will be of interest to, among others, water company professionals, policy makers, regulators, researchers, and environmental agencies.©

Record 103*

Subject: water – water conservation

Title: **Water Resources: Agricultural and Environmental Issues.**

Authors: Pimentel, David; Berger, Bonnie; Filiberto, David; Newton, Michelle; Wolfe, Benjamin; Karabinakis, Elizabeth; Clark, Steven; Poon, Elaine; Abbett, Elizabeth; Nandagopal, Sudha

Source: BioScience, Oct2004, Vol. 54 Issue 10, p909-918, 10p, 2 Charts

Subject Terms: **Water supply; biodiversity; drinking water; water conservation**

Abstract: The increasing demands placed on the global water supply threaten biodiversity and the supply of water for food production and other vital human needs. Water shortages already exist in many regions, with more than one billion people without adequate drinking water. In addition, 90% of the infectious diseases in developing countries are transmitted from polluted water. Agriculture consumes about 70% of fresh water worldwide; for example, approximately 1000 liters (L) of water are required to produce 1 kilogram (kg) of cereal grain, and 43,000 L to produce 1 kg of beef. New water supplies are likely to result from conservation, recycling, and improved water-use efficiency rather than from large development projects.©

Record 104

Subject: water – water conservation

Title: **Residential Water Use**

Authors: Ferrara, Ida

Source: OECD Papers; 2008, Vol. 8 Issue 2, p153-180, 28p

Subject Terms: **Water consumption; natural resources; water use; water supply; water conservation**

Abstract: The article presents a study which examines the factors affecting the utilization of

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residential water in Organisation for Economic Co-operation and Development (OECD) member countries including Great Britain, Australia, and the U.S. It notes the determinants of the demand for water use including socio-demographic characteristics and weather variables, attitudinal characteristics, and pricing policy measures. It compares the welfare implications of various government policies which are aimed to address extreme water supply shortage.

Record 105*

Subject: water – water conservation

Title: **To Play the Fool: Can Environmental Conservation and Democracy Survive Social Capital?**

Authors: Peterson, Tarla Rai; Peterson, M. Nils; Peterson, Markus J.; Allison, Stacey A.; Gore, David

Source: Communication & Critical/Cultural Studies; Jun2006, Vol. 3 Issue 2, p116-140, 25p

Subject Terms: **Habitat conservation; nature conservation; endangered species; water quality**

Abstract: Two community-based conservation processes in the United States provide comparative case studies to examine how social capital relates to democracy. Following a summary of social capital research, we describe the cases: one designed to preserve an endangered species and the other to restore water quality. We discuss how social capital dampened democratic practice in one case, while invigorating it in the other. We conclude that, by relying indiscriminately on social capital in the absence of complementary state structures, conservationists risk losing the very nature they seek to defend, and all citizens risk losing the energy and space essential to democracy.©

Record 106*

Subject: water – water conservation

Title: **Selecting Agricultural Best Management Practices for Water Conservation and Quality Improvements Using Atanassov's Intuitionistic Fuzzy Sets.**

Authors: Hernandez, E.; Uddameri, Venkatesh

Source: Water Resources Management; Dec2010, Vol. 24 Issue 15, p4589-4612, 24p

Subject Terms: **Water conservation; water quality; groundwater**

Abstract: Improper agricultural practices can affect ground water through leaching, surface water through runoff, algae infestations, deforestation, and air quality through burning operations and ammonia emissions. These effects may be mitigated through the institution of best management practices. The utility of best management practices (BMPs) is recognized and being actively promoted by agricultural agencies; however, identifying a set of mandatory BMPs is inappropriate given variations between climactic, demographic and geographic regions as well as differences in farming practices. In this study, a multi-criteria decision making model based on Atanassov's Intuitionistic Fuzzy Set (A-IFS) theory is introduced and its utility to rank agricultural best management practices is illustrated using a case-study from South Texas. Implementation of the A-IFS MCDM method to the South Texas region resulted in 'irrigation scheduling' being ranked as the most preferred alternative, while 'brush control/management' was the least preferred. The A-IFS MCDM approach was particularly suitable for prioritizing and ranking agricultural best management

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practices because decision makers often tend to have both likes and dislikes with regards to specific BMPs and for a given evaluation attribute. Not only does the A-IFS MCDM method provide a single composite score to rank the BMP alternatives, but the output of the A-IFS MCDM method also includes upper and lower bounds that help identify the uncertainties in the decision making process.

Record 107*

Subject: water – water conservation

Title: Water Conservation and Management.

Authors:

Source: Population Reports, Sep98, Vol. 26 Issue 1, p20, 4p

Subject Terms: Water management; water conservation

Abstract: Reports on ways in which freshwater can be better managed and conserved. Information on the amount of water used for agriculture; Details on the need for improved irrigation systems; Reference to the use of treated urban wastewater from towns and cities; In-depth look at the need to slow population growth.

Record 108

Subject: water – water conservation

Title: Re-thinking water scarcity: Can science and technology solve the global water crisis?

Authors: Lopez-Gunn, Elena; Ramón Llamas, Manuel

Source: Natural Resources Forum; Aug2008, Vol. 32 Issue 3, p228-238, 11p, 1 Black and White Photograph, 6 Charts, 1 Graph

Subject Terms: Water quality management; technological innovations; water supply; water conservation; groundwater recharge; saline water conversion; geographic information system; hydrogeology

Abstract: This paper provides examples from the last fifty years of scientific and technological innovations that provide relatively easy, quick and affordable means of addressing key water management issues. Scientific knowledge and technological innovation can help open up previously closed decision-making systems. Four of these tools are discussed in this paper: a) the opportunities afforded by virtual water trade; b) the silent revolution for beneficial use of groundwater; c) salt water desalination; and finally, d) the use of remote sensing and geographic information systems (GIS). Together these advances are changing the options available to address water and food security that have been predominant for centuries in the minds of most water decision-makers.©

Record 109

Subject: water – water conservation

Title: Conservation Integral to a Sustainable Water Supply.

Authors:

Source: American Water Works Association; Jun2007, Vol. 99 Issue 6, p82-83, 2p

Subject Terms: water conservation; conservation of natural resources; environmental protection; sustainable development; water utilities; waterworks; water-supply engineering

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Abstract: The article highlights the importance of water conservation to El Paso Water Utility's (EPWU) sustainable water program in El Paso, Texas. The water conservation program of EPWU has both mandatory and voluntary components. A water conservation ordinance that prohibits water waste and includes year-round restrictions on certain water use activities is implemented. EPWU also collaborates with other city departments, environmental organizations and civic groups in its educational efforts. It produces bilingual printed materials to increase awareness of regional water issues.

Record 110*

Subject: Water – water management

Title: **Bi-national water issues in the Rio Grande/Río Bravo basin**

Authors: Jurgen Schmandt

Source: In Water Policy 4(2):137-155

Subject Terms: **Water management; US–Mexico border; Water planning; Sustainable development**

Abstract: The Rio Grande (called the Río Bravo in Mexico) is the fifth largest river on the North American continent. The river supports extensive irrigated agriculture as well as rapidly growing cities in three US and five Mexican states. From El Paso, Texas to the Gulf of Mexico, the river marks the international border between Mexico and the United States. Treaties for sharing the water of the Rio Grande between the two countries and arrangements for joint management were concluded in 1906 and 1944. Over time, a complex system of water management institutions has emerged. Water problems are pronounced, due to intensive development in an arid environment. Over the course of the last 40 years, the population in the border communities has doubled every 20 years. Demographic projections predict another doubling of the population by 2030. The entire Rio Grande basin is arid or semi-arid. Development has already led to a severe loss of biodiversity in parts of the basin. Development of new surface water resources is not a realistic option. The principal water management options are as follows: improved efficiency of water use, transfer of agricultural to urban uses of water, conservation and re-use of water, and treatment of brackish groundwater. Up to now, differences in law and levels of development between Mexico and the United States have made it difficult to develop basin-wide management strategies. In addition, regional differences in hydrological conditions argue in favor of developing separate but linked strategies for the sub-basins. This paper presents the key issues in two sub-basins with the largest population centers on the international border—the Paso del Norte (Las Cruces, New Mexico, El Paso, Texas and Ciudad Juárez, Chihuahua), and the Rio Grande Valley (Reynosa–Matamoros on the Mexican side, and MacAllen–Brownsville on the US side). Together, these cities will have 8 million inhabitants by 2030. The paper concludes with suggestions for improving management of river and groundwater in this bi-national growth region.

Record 111*

Subject: water – water diversion

Title: **Defending Corpus Christi.**

Authors: Massengill, Jeff; Moore, Brent; Garza, Dan; Hayes, Allan

Source: Civil Engineering (08857024), Jun2008, Vol. 78 Issue 6, p48-81, 8p, 3 Color

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Photographs, 5 Diagrams

Subject Terms: **Water diversion; hydraulic engineering; flood control; see-walls**

Abstract: The article provides a historical account of the seawall construction in Corpus Christi, Texas designed to protect the downtown area from storm surges and to stabilize and beautify the shoreline. The idea of the seawall construction is not to experience anymore the disaster brought by a hurricane in 1919, where hundreds of people lost their lives. This 4-mile long flood protection system consists of approximately 2,000 tons of steel sheetpiling, 70,000 linear feet of timber piles, and 22,000 cubic yards of concrete. The seawall shields the downtown business district from hurricane-induced floods and storm surges, and it also provides an entertainment venue for the tourism-dependent coastal community.

Record 112*

Subject: water – water efficiency

Title: **Using EPIC model to manage irrigated cotton and maize.**

Authors: Ko, Jonghan; Piccinni, Giovanni; Steglich, Evelyn³

Source: Agricultural Water Management; Sep2009, Vol. 96 Issue 9, p1323-1331, 9p

Subject Terms: **Water efficiency; irrigation efficiency; evapotranspiration; irrigation management**

Abstract: Simulation models are becoming of interest as a decision support system for management and assessment of crop water use and of crop production. The Environmental Policy Integrated Climate (EPIC) model was used to evaluate its application as a decision support tool for irrigation management of cotton and maize under South Texas conditions. Simulation of the model was performed to determine crop yield, crop water use, and the relationships between the yield and crop water use parameters such as crop evapotranspiration (ET_c) and water use efficiency (WUE). We measured actual ET_c using a weighing lysimeter and crop yields by field sampling, and then calibrated the model. The measured variables were compared with simulated variables using EPIC. Simulated ET_c agreed with the lysimeter, in general, but some simulated ET_c were biased compared with measured ET_c. EPIC also simulated the variability in crop yields at different irrigation regimes. Furthermore, EPIC was used to simulate yield responses at various irrigation regimes with farm fields' data. Maize required ~700mm of water input and ~650mm of ET_c to achieve a maximum yield of 8.5Mgha⁻¹ while cotton required between 700 and 900mm of water input and between 650 and 750mm of ET_c to achieve a maximum yield of 2.0–2.5Mgha⁻¹. The simulation results demonstrate that the EPIC model can be used as a decision support tool for the crops under full and deficit irrigation conditions in South Texas. EPIC appears to be effective in making long-term and pre-season decisions for irrigation management of crops, while reference ET and phenologically based crop coefficients can be used for in-season irrigation management. ©

Record 113*

Subject: water – water efficiency

Title: **Corn yield responses under crop evapotranspiration-based irrigation management.**

Authors: Ko, Jonghan; Piccinni, Giovanni

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Source: Agricultural Water Management; May2009, Vol. 96 Issue 5, p799-808, 10p

Subject Terms: Water efficiency; irrigation farming; evapotranspiration; water supply

Abstract: Improving irrigation water management is becoming important to produce a profitable crop in South Texas as the water supplies shrink. This study was conducted to investigate grain yield responses of corn (*Zea mays*) under irrigation management based on crop evapotranspiration (ETC) as well as a possibility to monitor plant water deficiencies using some of physiological and environmental factors. Three commercial corn cultivars were grown in a center-pivot-irrigated field with low energy precision application (LEPA) at Texas AgriLife Research Center in Uvalde, TX from 2002 to 2004. The field was treated with conventional and reduced tillage practices and irrigation regimes of 100%, 75%, and 50% ETC. Grain yield was increased as irrigation increased. There were significant differences between 100% and 50% ETC in volumetric water content (θ), leaf relative water content (RWC), and canopy temperature (T C). It is considered that irrigation management of corn at 75% ETC is feasible with 10% reduction of grain yield and with increased water use efficiency (WUE). The greatest WUE (1.6gm⁻² mm⁻¹) achieved at 456mm of water input while grain yield plateaued at less than 600mm. The result demonstrates that ETC-based irrigation can be one of the efficient water delivery schemes. The results also demonstrate that grain yield reduction of corn is qualitatively describable using the variables of RWC and T C. Therefore, it appears that water status can be monitored with measurement of the variables, promising future development of real-time irrigation scheduling.©

Record 114*

Subject: water – water efficiency

Title: Household Adoption of Water-Efficient Equipment: The Role of Socio-Economic Factors, Environmental Attitudes and Policy.

Authors: Millock, Katrin; Nauges, Céline

Source: Environmental & Resource Economics; Aug2010, Vol. 46 Issue 4, p539-565, 27p, 10 Charts

Subject Terms: Water use research; environmental policy; water efficiency; household surveys; probability theory

Abstract: Using survey data of around 10,000 households from 10 OECD countries, we identify the driving factors of household adoption of water-efficient equipment by estimating Probit models of a household's probability to invest in such equipment. The results indicate that environmental attitudes and ownership status are strong predictors of adoption of water-efficient equipment. In terms of policy, we find that households that were both metered and charged for their water individually had a much higher probability to invest in water-efficient equipment compared to households that paid a flat fee.©

Record 115*

Subject: water – water efficiency

Title: Forage potential of *Opuntia* clones maintained by the USDA, national plant germplasm system (NPGS) collection

Authors: Felker, P; Paterson, A; Jenderek, MM

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Source: CROP SCIENCE; SEP-OCT, 2006, 46 5, p2161-p2168, 8p.

Subject Terms: Water use efficiency; South Texas;

Abstract: Short term gas exchange measurements and long term field trials have confirmed the several fold greater water to dry matter conversion efficiency of cactus than C3 and C4 plants. The protein and dry matter digestibility of Opuntia typically are in the 60 to 70% range and are on par with other high quality forages. While the protein content is low (ca. 6%), as is usually observed in unfertilized rangeland, fertilization can increase the protein to 10 to 15%. The high mineral content (4.2% Ca and 2.3% K) would appear to be beneficial to lactating animals. The high water content, maintained in drought periods, is useful in meeting animal water requirements. In both Mexico and the USA spiny varieties have been utilized by burning off spines in the field with propane torches, or by use of stationary forage choppers at the dairy/feedlot. Spineless varieties require intensive fencing for protection against wildlife and uncontrolled livestock. Spineless varieties generally have less tolerance to freezing weather than spiny varieties. It has been estimated that about 400000 ha of spineless varieties have been planted in Brazil, from 700000 to 1000000 ha in northern Africa and that cactus was an important forage component on 3 million ha of grazing lands in northern Mexico. The majority of the spiny and spineless types used worldwide for forage are preserved in the USDA NPGS germplasm collection. This paper reviews the environmental adaptability and most important nutritional characteristics of major forage clones. Spineless clones are described that are adaptable to USDA cold hardiness zones 7, 8, and 9.

Record 116*

Subject: water – water supply

Title: A framework for regional association rule mining and scoping in spatial datasets.

Authors: Ding, Wei; Eick, Christoph; Yuan, Xiaojing; Wang, Jing; Nicot, Jean-Philippe

Source: Geoinformatica; Mar2011, Vol. 15 Issue 1, p1-28, 28p, 5 Diagrams, 2 Charts, 5 Maps

Subject Terms: Water pollution; water supply

Abstract: The motivation for regional association rule mining and scoping is driven by the facts that global statistics seldom provide useful insight and that most relationships in spatial datasets are geographically regional, rather than global. Furthermore, when using traditional association rule mining, regional patterns frequently fail to be discovered due to insufficient global confidence and/or support. In this paper, we systematically study this problem and address the unique challenges of regional association mining and scoping: (1) region discovery: how to identify interesting regions from which novel and useful regional association rules can be extracted; (2) regional association rule scoping: how to determine the scope of regional association rules. We investigate the duality between regional association rules and regions where the associations are valid: interesting regions are identified to seek novel regional patterns, and a regional pattern has a scope of a set of regions in which the pattern is valid. In particular, we present a reward-based region discovery framework that employs a divisive grid-based supervised clustering for region discovery. We evaluate our approach in a real-world case study to identify spatial risk patterns from arsenic in the Texas water supply. Our experimental results confirm and validate

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research results in the study of arsenic contamination, and our work leads to the discovery of novel findings to be further explored by domain scientists.©

Record 117*

Subject: water – water supply

Title: **Bayesian analysis of groundwater quality in a semi-arid coastal county of south Texas.**

Authors: Uddameri, V.

Source: Environmental Geology; Jan2007, Vol. 51 Issue 6, p941-951, 11p, 5 Charts, 4 Graphs, 1 Map

Subject Terms: **Groundwater; water pollution; municipal water supply; hydrogeology; water quality management; water quality management**

Abstract: Bayesian frameworks for comparing water quality information to a pre-specified standard or goal and comparing water quality characteristics among two different entities are presented and illustrated using chloride and total dissolved solids (TDS) measurements obtained in the shallower Chicot and the deeper Evangeline formations of the Gulf coast aquifer underlying Refugio County, TX. The Bayesian approach seeks to present evidence in favor of the competing hypotheses which are weighed equally and unlike classical statistics do not make a decision in favor of one hypothesis. When comparing water quality information to a specified goal, the Bayesian approach addresses the more practical question—given all the information, what is the probability of meeting the goal? Similarly, when comparing the water quality between two entities, the approach simply emphasizes the nature and extent of differences and as such is better suited for evaluative studies. Bayesian analysis indicated that average chloride concentrations in the Evangeline formation was 1.65 times the concentrations in the Chicot formation while the corresponding TDS concentration ratio was close to unity. The probability of identifying water with TDS $\leq 1,000$ g/m³ was extremely low, especially in the more prolific Evangeline formation. The probability of groundwater supplies with mean chloride concentrations ≤ 500 g/m³ was relatively high in the Chicot formation but very low in the Evangeline formation indicating the possible need for blending groundwater with other sources to meet municipal water quality goals.©

Record 118*

Subject: Water – sustainable agriculture

Title: **Constructed wetlands as recirculation filters in large-scale shrimp aquaculture**

Authors: David Rogers Tilley; Harish BadrinarayananF.; Ronald Rosati; Jiho Son

Source: Aquacultural Engineering 26(2):81-109

Subject Terms: **constructed wetlands; shrimp aquaculture; water quality; sustainable farming; ecological engineering**

Abstract: Effluent waters from shrimp aquaculture, which can contain elevated levels of phosphorus, ammonia, nitrate, and organics, must be managed properly if shrimp aquaculture is to achieve sustainability. Constructed wetlands are ecologically beneficial, low cost treatment alternatives proven capable of reducing suspended solids, biochemical oxygen demand (BOD), nitrogen, phosphorus and heavy metals

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from wastewater of many sources. The goal of this study was to determine how well a constructed wetland performed as a filter in a full-scale shrimp aquaculture operation. A 7.7 ha (19 ac) mesohaline (3–8 ppt) constructed wetland treating 13,600 m³ per day (3.6 MGD) of effluent from 8.1 ha (20 ac) of intensively farmed shrimp ponds at the Loma Alta Shrimp Aquaculture Facility (LASAF), located along the coast of the Gulf of Mexico in semi-arid South Texas, was found to reduce concentrations of total phosphorus (TP), total suspended solids (TSS) and inorganic suspended solids (ISS) by 31, 65 and 76%, respectively, during recirculation, and maintained consistently low levels of mean BOD (<9 mg l⁻¹), total ammonia (<1.8 mg N l⁻¹) and nitrate (<0.42 mg N l⁻¹). Determination of parameter values for the k–C* wetland design model for ISS or TP showed that mean target levels could be achieved, given expected influent concentrations, when the ratio of pond surface to wetland surface was 12. Constructed wetlands can perform satisfactorily as recirculation filters in large-scale shrimp aquaculture operations, reducing the impact of effluent on local water bodies, conserving large quantities of water and providing valuable ecological habitat.

Record 119*

Subject: water – sustainable agriculture

Title: Onion Yield and Quality Response to Two Irrigation Scheduling Strategies.

Authors: Enciso, Juan; Wiedenfeld, Bob; Jifon, John; Nelson, Shad

Source: Scientia Horticulturae; May2009, Vol. 120 Issue 3, p301-305, 5p

Subject Terms: irrigation farming; onions; crop yields; crops—quality; irrigation engineering; sustainable agriculture

Abstract: Irrigation technologies that conserve water are necessary to assure the economic and environmental sustainability of commercial agriculture. This study was conducted in the Rio Grande Valley in Texas to evaluate yield and quality of subsurface drip irrigated onions (*Allium cepa* L.) using different scheduling strategies and water stress levels. One strategy consisted of initiating irrigation when the reading of a granular matrix sensors (Watermark® 1 [1] Mention of a trademark, proprietary product or vendor does not constitute a guarantee or warranty of the product, nor does it imply approval or disapproval to the exclusion of other products or vendors that may also be suitable. soil moisture sensor, Irrrometer, Co., Riverside, CA) installed at 0.2m depth reached –20kPa (optimum), –30kPa and –50kPa. The second strategy was to replace 100%, 75%, and 50% of crop evapotranspiration (ET_c) weekly. Higher total yields, and jumbo onion size yields were obtained when the soil moisture was kept above –30kPa. Yields were not affected when water applications were reduced from 100% to 75% ET_c and from –20 to –30kPa. The ET_c strategies of 100%, and 75% ET_c resulted in similar water usage to the soil moisture monitoring strategies of initiating irrigation at –20 and –30kPa. Total yields dropped significantly when soil water stress increased below –50kPa. For the ET based strategy yields also dropped with the 50% ET_c treatment. Onion bulb pungency and brix were unaffected by water level.©

Record 120*

Subject: water – water pollution

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Title: **Responsible Care: Strategies for Pollution Prevention and Environment Management in E & P Sector of Petroleum Industry.**

Authors: Sharma, J. S.

Source: Proceedings of World Academy of Science: Engineering & Technology; Mar2009, Vol. 51, p376-383, 8p, 9 Charts

Subject Terms: **Pollution prevention; petroleum industry; waste minimization; conservation of natural resources; water consumption; environmental protection**

Abstract: The paper discusses the Oil and Natural Gas Corporation's (ONGC) key initiatives and strategies being followed for pollution prevention and environment management for exploration and production related operations. Waste minimization and estimation of water requirement have been attempted for drilling a 4000 meters and 2200 meters depth of well. Forward planning has been done to reduce the waste generation and to determine the optimum size and shape of the waste pit based on various water consumption practices and hole volume of the well. Calculations and data on water management practices suggest that waste pit of 900 to 1200 M3 and 600 to 900 M3 are sufficient for above depth well. The waste water generation can be reduced by 50%. Ambient air quality and VOC samples were collected monitored and analyzed and are reported to be in the prescribed limits. Effluent analysis of inlet of the effluent and after treatment has been mentioned and a typical example of oil field effluent treatment plant has been discussed. The paper describes mainly the essential of forward planning for oil spill response and management focusing specifically on development of contingency plans including current practices being followed in ONGC and also existing framework on oil spill preparedness. Level of available oil spill preparedness and its status at west and east coast has also been discussed in view of E & P development projects in Mumbai and deep sea of KG basin area.

Record 121*

Subject: water – water pollution

Title: **Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico from Streams in the South-Central United States.**

Authors: Rebich, Richard A.; Houston, Natalie A.; Mize, Scott V.; Pearson, Daniel K.; Ging, Patricia B.; Evan Hornig, C.

Source: Journal of the American Water Resources Association; Oct2011, Vol. 47 Issue 5, p1061-1086, 26p

Subject Terms: **Watersheds; water distribution; water districts; water pollution; Gulf of Mexico**

Abstract: Rebich, Richard A., Natalie A. Houston, Scott V. Mize, Daniel K. Pearson, Patricia B. Ging, and C. Evan Hornig, 2011. Sources and Delivery of Nutrients to the Northwestern Gulf of Mexico From Streams in the South-Central United States. Journal of the American Water Resources Association (JAWRA) 47(5):1061-1086. DOI: 10.1111/j.1752-1688.2011.00583.x Abstract: SPATIALLY Referenced Regressions On Watershed attributes (SPARROW) models were developed to estimate nutrient inputs [total nitrogen (TN) and total phosphorus (TP)] to the northwestern part of the Gulf of Mexico from streams in the South-Central United States (U.S.). This area included drainages of the Lower Mississippi, Arkansas-White-Red, and Texas-Gulf hydrologic regions. The models were standardized to reflect nutrient sources and stream conditions during 2002. Model predictions of nutrient loads (mass per time) and

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yields (mass per area per time) generally were greatest in streams in the eastern part of the region and along reaches near the Texas and Louisiana shoreline. The Mississippi River and Atchafalaya River watersheds, which drain nearly two-thirds of the conterminous U.S., delivered the largest nutrient loads to the Gulf of Mexico, as expected. However, the three largest delivered TN yields were from the Trinity River/Galveston Bay, Calcasieu River, and Aransas River watersheds, while the three largest delivered TP yields were from the Calcasieu River, Mermentau River, and Trinity River/Galveston Bay watersheds. Model output indicated that the three largest sources of nitrogen from the region were atmospheric deposition (42%), commercial fertilizer (20%), and livestock manure (unconfined, 17%). The three largest sources of phosphorus were commercial fertilizer (28%), urban runoff (23%), and livestock manure (confined and unconfined, 23%).©

Record 122*

Subject: water – water pollution

Title: The applications of GIS in the analysis of the impacts of human activities on south Texas watersheds.

Authors: Merem EC ; Yerramilli S ; Twumasi YA ; Wesley JM ; Robinson B ; Richardson C

Source: International Journal Of Environmental Research And Public Health [Int J Environ Res Public Health] 2011 Jun; Vol. 8 (6), pp. 2418-46. Date of Electronic Publication: 2011 Jun 23.

Subject Terms: Geographic information systems; water pollution; conservation of natural resources; ecosystem; water movements

Abstract: With water resource planning assuming greater importance in environmental protection efforts, analyzing the health of agricultural watersheds using Geographic Information Systems (GIS) becomes essential for decision-makers in Southern Texas. Within the area, there exist numerous threats from conflicting land uses. These include the conversion of land formerly designated for agricultural purposes to other uses. Despite current efforts, anthropogenic factors are greatly contributing to the degradation of watersheds. Additionally, the activities of waste water facilities located in some of the counties, rising populations, and other socioeconomic variables are negatively impacting the quality of water in the agricultural watersheds. To map the location of these stressors spatially and the extent of their impacts across time, the paper adopts a mix scale method of temporal spatial analysis consisting of simple descriptive statistics. In terms of objectives, this research provides geo-spatial analysis of the effects of human activities on agricultural watersheds in Southern Texas and the factors fuelling the concerns under the purview of watershed management. The results point to growing ecosystem decline across time and a geographic cluster of counties experiencing environmental stress. Accordingly, the emergence of stressors such as rising population, increased use of fertilizer treatments on farm land, discharges of atmospheric pollutants and the large presence of municipal and industrial waste treatment facilities emitting pathogens and pesticides directly into the agricultural watersheds pose a growing threat to the quality of the watershed ecosystem.

Record 123*

Subject: water – water pollution

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Title: **Experimental Evidence for Microbially Mediated Carbonate Dissolution from the Saline Water Zone of the Edwards Aquifer, Central Texas.**

Authors: Engel, Annette Summers; Randall, Kelli Willson

Source: Geomicrobiology Journal; 2011, Vol. 28 Issue 4, p313-327, 15p, 1 Color Photograph, 2 Black and White Photographs, 1 Diagram, 2 Charts, 3 Graphs, 1 Map

Subject Terms: **Goundwater pollution; irrigation water; saltwater encroachment; Edward aquifer**

Abstract: Microbially induced carbonate dissolution was evaluated from sulfidic wells in the Edwards Aquifer, Texas. Filamentous biomass covers rock surfaces, with Gammaproteobacteria and Epsilonproteobacteria dominating the attached community, but novel Alphaproteobacteria dominating the planktonic community. Despite fluids being saturated with respect to calcite, experimental calcite from in situ microcosms had significantly greater mass loss when colonized. Moreover, neoformed gypsum crystals were observed on colonized surfaces where fluids were undersaturated with respect to gypsum. The results are similar to findings from shallow cave and karst environments, and highlight the underappreciated role of microbes in the modification of carbonate aquifers and reservoirs.©

Record 124*

Subject: water – water pollution

Title: **Exposure Elements in Oil Spill Risk and Natural Resource Damage Assessments: A Review.**

Authors: Boehm, Paul D.; Page, David S.

Source: Human & Ecological Risk Assessment; Mar/Apr2007, Vol. 13 Issue 2, p418-448, 31p, 1 Diagram, 3 Charts, 2 Graphs

Subject Terms: **Water pollution; oil spills; environmental impact analysis**

Abstract: The use of the ecological risk assessment (ERA) framework for assessing effects of oil spills is applicable to the injury assessment component of natural resource damage assessment (NRDA). Central to the ERA process is the assessment of exposure, the critical component linking the release of oil to the assessment of effects. Exposure of biological receptors to the toxic fractions of spilled oil, usually considered the polycyclic aromatic hydrocarbons (PAH), requires carefully designed and implemented assessment studies, which are periodically refocused on various environmental pathways and the various biological receptors of concern over the life history of an oil spill from initial release to recovery. As important is the detailed assessment of the exposure regime in the absence of a spill (i.e., the baseline or background exposure). A release of petroleum may not, in itself, equate to an effect on a natural resource. The presence of residual petroleum hydrocarbons does not imply either availability to living organisms or injury to a biological resource. Precise and accurate chemical concentration and compositional data for 2-6 ringed PAHs and alkylated homologues are the key toxicologically important chemical components that are central to the exposure assessment. These principles are illustrated in several oil spill case studies.©

Record 125*

Subject: water – water pollution

Title: **The Geographic Distribution of Population Health and Contaminant Body Burden in Gulf of Mexico Oysters.**

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Authors: Kim, Y.; Powell, E. N.; Wade, T. L.; Presley, B. J.; Brooks, J. M.

Source: Archives of Environmental Contamination & Toxicology; Jul2001, Vol. 41 Issue 1, p30-46, 17p

Subject Terms: **Oysters; water pollution**

Abstract: As part of NOAA's National Status and Trends Mussel Watch Program, oysters were sampled along the Gulf of Mexico coast each winter from 1986 to 1993 (The present analysis deals with 1986–1993 Mussel Watch data; the Mussel Watch project itself continues at this printing) and analyzed for trace metal, polynuclear aromatic hydrocarbons and pesticide body burden, plus a series of biological variables designed to assess population status and health. We identified contaminant and biological variables in which large-scale spatial processes played an important role in establishing population values by examining the likelihood that neighboring bays tended to have populations with body burdens or population attributes more similar than expected by chance. Local or watershed-dependent factors, such as land use and freshwater inflow, are important in controlling the bay-to-bay variation in body burden in most contaminants. However, the bay-to-bay variations in body burden of some metals (As, Cd, Hg, Ni, Se) appear to be principally influenced by larger-scale climatic factors. These metals and the biological variable shell length demonstrated a strong degree of similarity between bays over a large regional area reminiscent of the pattern shown by climatic factors, such as temperature and precipitation. In contrast, among the organics, none of the PAHs showed even a moderately strong climatic signal. Among the pesticides, only two did (dieldrin, total DDTs). These pesticides and the biological variables, reproductive stage and *Perkinsus marinus* prevalence and infection intensity, had spatial patterns that suggested both a local and a regional influence to their geographic distributions. This same pattern is exhibited by freshwater runoff. Metal contaminants also behaved distinctively compared to organics in the temporal influence of climate in establishing the interannual variability in body burden. For the organics, trends in interannual variability were strongly influenced by climate, whereas spatial trends were not. In contrast, most metals were unaffected by climatic forcing both spatially and temporally. However, all of the metals having a spatial pattern strongly influenced by climate (As, Cd, Hg, Ni, Se) also exhibited interannual variations related to variations in climate.©

Record 126*

Subject: water – water pollution

Title: **Organochlorines and trace elements in four colonial waterbird species nesting in the lower Laguna Madre, Texas**

Authors: Mora, M. A.

Source: Archives of Environmental Contamination & Toxicology; Nov1996, Vol. 31 Issue 4, p533, 0p

Subject Terms: **Water pollution; water bird**

Abstract: Eggs from four aquatic bird species nesting on the National Audubon Sanctuary Islands of the lower Laguna Madre were collected during 1993 and 1994 to determine concentrations of organochlorine compounds and trace metals and to evaluate their possible detrimental effects on birds nesting in this aquatic ecosystem. The only chlorinated hydrocarbons found above detection limits were p,p'-DDE (DDE), p,p'-DDT (DDT), HCB, HCH, chlordane, and polychlorinated biphenyls (PCBs). Median DDE and

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PCB levels in eggs of four species were below 1 µg/g ww. Concentrations of DDE were much greater (6–70 fold) than the concentrations of other chlorinated pesticides which were present at or near detection limits. One egg from a snowy egret contained 9.65 µg/g DDE, 0.056 µg/g DDD, and 1.75 µg/g DDT. Ten heavy metals and trace elements (Hg, Se, B, Cr, Cu, Fe, Mg, Mn, Sr, and Zn) were detected in 90% of the samples but at levels that were not of concern. In 1993–1994, concentrations of DDE in eggs of aquatic birds of the lower Laguna Madre were much lower than levels detected in this area during the late 1970s and early 1980s. Concentrations of DDE, PCBs, and trace metals in eggs detected in this study could not be associated with deformities or other detrimental effects on birds. ©

Record 127*

Subject: water – water pollution

Title: Arsenic, Nitrate, Chloride and Bromide Contamination in The Gulf Coast Aquifer, South-Central Texas, USA

Authors: Hudak, Paul F.

Source: International Journal of Environmental Studies; Apr2003, Vol. 60 Issue 2, p123, 11p

Subject Terms: Water pollution; petroleum industry; agriculture

Abstract: Arsenic, nitrate, chloride, and bromide concentrations in the Gulf Coast Aquifer of south-central Texas, USA, were compiled, mapped, and evaluated in the context of local land use and geology. Agriculture and oil production are predominant land uses and potential sources of groundwater contamination in the study area. Data were compiled from 69 wells with a median depth of 160.5 m. Eight observations surpassed the 44.3 mg/L standard for nitrate (10mg/L NO₃-N), and 24 observations exceeded the 10 µg/L standard for arsenic. There was a statistically significant, inverse correlation between nitrate and well depth, and a direct correlation between nitrate and arsenic. Arsenic concentrations were significantly higher in a uranium-bearing sand formation compared to other formations in the study area. Chloride concentrations were also high relative to the (secondary) drinking water standard (250 mg/L), with a median of 342mg/L and maximum of 6840mg/L. Most chloride/bromide ratios were near 300, but there were four significantly lower values, consistent with oilfield brine or evaporite dissolution. Results of this study suggest that (1) geology exerts a major control on arsenic concentrations in groundwater, (2) agricultural activity contributes substantially to nitrate and chloride and, to a lesser extent, arsenic concentrations in groundwater, and (3) oilfield brine has locally impacted groundwater in the study area. ©

Record 128*

Subject: water – water pollution

Title: A simplified approach for monitoring hydrophobic organic contaminants associated with suspended sediment: methodology and applications.

Authors: Mahler BJ ; Van Metre PC

Source: Archives Of Environmental Contamination And Toxicology [Arch Environ Contam Toxicol] 2003 Apr; Vol. 44 (3), pp. 288-97.

Subject Terms: Environmental monitoring; geologic sediments; water pollution; fresh water

Abstract: Hydrophobic organic contaminants, although frequently detected in bed sediment

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and in aquatic biota, are rarely detected in whole-water samples, complicating determination of their occurrence, load, and source. A better approach for the investigation of hydrophobic organic contaminants is the direct analysis of sediment in suspension, but procedures for doing so are expensive and cumbersome. We describe a simple, inexpensive methodology for the dewatering of sediment and present the results of two case studies. Isolation of a sufficient mass of sediment for analyses of organochlorine compounds and PAHs is obtained by in-line filtration of large volumes of water. The sediment is removed from the filters and analyzed directly by standard laboratory methods. In the first case study, suspended-sediment sampling was used to determine occurrence, loads, and yields of contaminants in urban runoff affecting biota in Town Lake, Austin, TX. The second case study used suspended-sediment sampling to locate a point source of PCBs in the Donna Canal in south Texas, where fish are contaminated with PCBs. The case studies demonstrate that suspended-sediment sampling can be an effective tool for determining the occurrence, load, and source of hydrophobic organic contaminants in transport.©

Record 129*

Subject: water – water pollution

Title: Characterization and Degradation of Petroleum Hydrocarbons Following an Oil Spill into a Coastal Environment of South Texas, U.S.A.

Authors: Sharma, Virender K.; Hicks, Steven D.; Rivera, Wayne; Vazquez, Felipe G

Source: Water, Air & Soil Pollution; Feb2002, Vol. 134 Issue 1-4, p111-127, 17p

Subject Terms: Water pollution; waste spills; oil spills; hydrocarbons

Abstract: Petroleum hydrocarbons were characterized at eleven sites within the sediments of a coastal stream in south Texas, U.S.A. following a medium sized crude oil spill. Bank and open-water (deep) sediments were collected at each site. Hydrocarbons targeted for analysis included 22 aliphatic hydrocarbons (C-11 to C-34) and 16 polynuclear aromatic hydrocarbons. Sediment concentrations were measured at intervals of 1, 2, 3, 4, 6, and 12 months post-spill. Higher hydrocarbon concentrations were observed for a longer duration within the deep sediments than bank sediments. Initial hydrocarbon constituents in impacted sediments matched the crude oil fingerprint accurately with the exception of the lighter-end hydrocarbons. The lighter-end aliphatic hydrocarbons are affected immediately by evaporation and dissolution processes during the spill event and were found below the detection levels at most of the sites. Total hydrocarbon concentrations in sediments within each hydrocarbon group returned to background levels by the end of the study period. Observed decreases in high molecular weight polycyclic aromatic hydrocarbons (PAH) concentrations exceeded known environmental degradation rates which suggests the influence of a sediment transport process. Overall, the fate of petroleum hydrocarbons within this type of environment were likely related to both degradation and sediment transport processes. By the end of the study period, most individual PAH constituent concentrations were below threshold concentrations thought to produce toxic effects in marine and estuarine organisms. PAH constituents concentrations remaining above threshold concentrations included benz(a)anthracene, chrysene, and benzo(a)pyrene.

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Record 130***Subject: water – watersheds****Title:** **The applications of GIS in the analysis of the impacts of human activities on south Texas watersheds.****Authors:** Merem EC ; Yerramilli S ; Twumasi YA ; Wesley JM ; Robinson B ; Richardson C**Source:** International Journal Of Environmental Research And Public Health [Int J Environ Res Public Health] 2011 Jun; Vol. 8 (6), pp. 2418-46. Date of Electronic Publication: 2011 Jun 23.**Subject Terms:** **Conservation of natural resources ; ecosystem ; environmental health ; humans ; rivers ; Texas ; water Movements; water pollution; Geographic information systems****Abstract:** With water resource planning assuming greater importance in environmental protection efforts, analyzing the health of agricultural watersheds using Geographic Information Systems (GIS) becomes essential for decision-makers in Southern Texas. Within the area, there exist numerous threats from conflicting land uses. These include the conversion of land formerly designated for agricultural purposes to other uses. Despite current efforts, anthropogenic factors are greatly contributing to the degradation of watersheds. Additionally, the activities of waste water facilities located in some of the counties, rising populations, and other socioeconomic variables are negatively impacting the quality of water in the agricultural watersheds. To map the location of these stressors spatially and the extent of their impacts across time, the paper adopts a mix scale method of temporal spatial analysis consisting of simple descriptive statistics. In terms of objectives, this research provides geo-spatial analysis of the effects of human activities on agricultural watersheds in Southern Texas and the factors fuelling the concerns under the purview of watershed management. The results point to growing ecosystem decline across time and a geographic cluster of counties experiencing environmental stress. Accordingly, the emergence of stressors such as rising population, increased use of fertilizer treatments on farm land, discharges of atmospheric pollutants and the large presence of municipal and industrial waste treatment facilities emitting pathogens and pesticides directly into the agricultural watersheds pose a growing threat to the quality of the watershed ecosystem.**Record 131*****Subject: water – watersheds****Title:** **Using swat to Model Streamflow in Two River Basins With Ground and Satellite Precipitation Data****Authors:** Tobin, KJ; Bennett, ME**Source:** JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION; FEB, 2009, 45 1, p253-p271, 19p.**Subject Terms:** **Watersheds; rainfall; rain gauge data; nexrad precipitation; water resources****Abstract:** Both ground rain gauge and remotely sensed precipitation (Next Generation Weather Radar NEXRAD Stage III) data have been used to support spatially distributed hydrological modeling. This study is unique in that it utilizes and compares the performance of National Weather Service (NWS) rain gauge, NEXRAD Stage III, and Tropical Rainfall Measurement Mission (TRMM) 3B42 (Version 6) data for the hydrological modeling of the Middle Nueces River Watershed in South Texas and Middle Rio Grande Watershed in South Texas and northern Mexico. The hydrologic

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model chosen for this study is the Soil and Water Assessment Tool (SWAT), which is a comprehensive, physical-based tool that models watershed hydrology and water quality within stream reaches. Minor adjustments to selected model parameters were applied to make parameter values more realistic based on results from previous studies. In both watersheds, NEXRAD Stage III data yields results with low mass balance error between simulated and actual streamflow (+/- 13%) and high monthly Nash-Sutcliffe efficiency coefficients (NS > 0.60) for both calibration (July 1, 2003 to December 31, 2006) and validation (2007) periods. In the Middle Rio Grande Watershed NEXRAD Stage III data also yield robust daily results (time averaged over a three-day period) with NS values of (0.60-0.88). TRMM 3B42 data generate simulations for the Middle Rio Grande Watershed of variable quality (MBE = +13 to -16%; NS = 0.38-0.94; RMSE = 0.07-0.65), but greatly overestimates streamflow during the calibration period in the Middle Nueces Watershed. During the calibration period use of NWS rain gauge data does not generate acceptable simulations in both watersheds. Significantly, our study is the first to successfully demonstrate the utility of satellite-estimated precipitation (TRMM 3B42) in supporting hydrologic modeling with SWAT; thereby, potentially extending the realm (between 50 degrees N and 50 degrees S) where remotely sensed precipitation data can support hydrologic modeling outside of regions that have modern, ground-based radar networks (i. e., much of the third world).©

Record 132*

Subject: water – groundwater

Title: Do Texas groundwater conservation districts matter?

Authors: Foster, J. R.

Source: Water Policy; 2009, Vol. 11 Issue 3, p379-399, 21p, 3 Maps

Subject Terms: Water districts; water conservation; groundwater; water management; panel analysis

Abstract: Texas faces a number of issues in an attempt to balance the water needs of a growing population while at the same time trying to conserve its water resources. Some of these issues include infrastructure improvements and provision of new supplies, changing patterns of use, water marketing and aquifer depletion. With aquifers providing 60% of all the water used in Texas, protecting and keeping these sources viable in the future is a key priority in addressing the state's water issues. With the state's emphasis on local control and the existence of between 80 and 90 groundwater districts state-wide, this research seeks to answer the question "Do groundwater districts in the State of Texas make a difference in groundwater depletion?" We use panel data from a set of 8,110 observations in a fixed effects regression to help us answer this question. We find evidence to suggest that groundwater districts do make a difference. After taking into consideration a couple of potential threats to validity, we run our model on a per district basis and by groundwater management areas. We also run it on a per aquifer basis and compare results with recommendations in the 2007 Texas Water Plan as a reality check. If we successfully answer the question that districts do in fact matter, the next logical step is to investigate what it is that districts do that makes a difference.©

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Record 133***Subject: water – water groundwater**

Title: **Comparison of Configurations for High-Recovery Inland Desalination Systems.**

Authors: Qiu, Tianyu; Davies, Philip A.

Source: Water (20734441); Sep2012, Vol. 4 Issue 3, p690-706, 17p, 10 Diagrams, 3 Charts, 3 Graphs

Subject Terms: **Water supply; groundwater; seawater; energy consumption**

Abstract: Desalination of brackish groundwater (BW) is an effective approach to augment water supply, especially for inland regions that are far from seawater resources. Brackish water reverse osmosis (BWRO) desalination is still subject to intensive energy consumption compared to the theoretical minimum energy demand. Here, we review some of the BWRO plants with various system arrangements. We look at how to minimize energy demands, as these contribute considerably to the cost of desalinated water. Different configurations of BWRO system have been compared from the view point of normalized specific energy consumption (SEC). Analysis is made at theoretical limits. The SEC reduction of BWRO can be achieved by (i) increasing number of stages, (ii) using an energy recovery device (ERD), or (iii) operating the BWRO in batch mode or closed circuit mode. Application of more stages not only reduces SEC but also improves water recovery. However, this improvement is less pronounced when the number of stages exceeds four. Alternatively and more favourably, the BWRO system can be operated in Closed Circuit Desalination (CCD) mode and gives a comparative SEC to that of the 3-stage system with a recovery ratio of 80%. A further reduction of about 30% in SEC can be achieved through batch-RO operation. Moreover, the costly ERDs and booster pumps are avoided with both CCD and batch-RO, thus furthering the effectiveness of lowering the costs of these innovative approaches.©

Record 134***Subject: water – water groundwater**

Title: **Design Space Characterization for Meeting Cost and Carbon Reduction Goals Smart Irrigation Controllers in the Southwestern United States.**

Authors: Mutchek, Michele A.; Williams, Eric D.

Source: Journal of Industrial Ecology; Oct2010, Vol. 14 Issue 5, p727-739, 13p, 1 Illustration, 1 Diagram, 7 Graphs

Subject Terms: **Water consumption; irrigation**

Abstract: Smart irrigation controllers (SICs) can save water by adapting watering schedules to climate and soil conditions. The potential benefit of SICs is particularly high in southwestern U.S. states, where the arid climate makes water scarcer and increases watering needs of landscapes. A number of studies have tested the ability of SICs to save water in residential and small commercial settings. Results generally show overall savings, but there is substantial variability, including cases of increased water use. Though there are many controllers on the market, we argue there is a further need for optimization of design and field performance. To inform the technology development process, we develop a design for environment method, which overlays economic and environmental performance parameters under different operating conditions. This method is applied to characterize design goals for controller price and water savings that SICs must meet to yield life cycle carbon dioxide reductions and economic savings in southwestern U.S. states, accounting for regional variability in electricity and water prices and carbon overhead. Results from applying the model to

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SICs in the Southwest suggest that some areas are significantly easier to design for. One concept to realize improved design in practice is to build out the controller market in a staged set of niches, starting from a more favorable area then moving toward more challenging conditions.©

Record 135*

Subject: water – groundwater

Title: Fluoride levels in Texas groundwater

Authors: Hudak, P. F.

Source: Journal of Environmental Science & Health, Part A: Toxic/Hazardous Substances & Environmental Engineering; 1998, Vol. A33 Issue 7, p1659, 0p

Subject Terms: Aquifers; drinking water; groundwater; water quality

Abstract: The purpose of this study was to compile, map, and evaluate regional patterns of fluoride concentrations in Texas groundwater. County-median fluoride levels were calculated from nearly 7,000 wells distributed among 237 Texas counties. Four regions having high fluoride levels were identified. These regions occupy parts of west, southwest, north-central, and south Texas. At least 50 percent of the fluoride observations in each of five Texas counties exceeded the primary drinking water standard of 4.0 mg/L. All of those counties are located in northwest Texas. Statewide, 25 counties had a median fluoride level above the secondary standard of 2.0 mg/L. Several factors contribute to elevated fluoride levels in Texas aquifers, including seepage from nearby saline formations, sparse recharge and dilution, and native mineral constituents of the aquifers. Results of this study suggest that: (1) regional geology influences fluoride concentrations in Texas, (2) statewide, the pattern is not random, (3) fluoride levels are generally higher in the western part of the state, and (4) regions which warrant further monitoring include west-central and north-central Texas.©

Record 136*

Subject: water – water consumption

Title: The Changing Geography of the U.S. Water Budget: Twentieth-Century Patterns and Twenty-First-Century Projections.

Authors: Cowell, C. Mark; Urban, Michael A.

Source: Annals of the Association of American Geographers; Oct 2010, Vol. 100 Issue 4, p740-754, 15p, 1 Chart, 2 Graphs, 6 Maps

Subject Terms: Water supply; water temperature; water consumption; droughts; rain & rainfall; evapotranspiration; climatic changes

Abstract: Persistent changes in temperature and precipitation patterns have dramatic effects on the availability of surface water for natural vegetation, streamflow, agricultural production, and human consumption. We use a combination of historical observational climate data and water budget equations to develop time-series and maps of twentieth-century water variables within the contiguous United States and compare these with anticipated twenty-first-century patterns projected by global climate models. The results graphically demonstrate regional variation in hydroclimatic trends: areas that experienced convergent actual (AET) and potential evapotranspiration (PET) rates during the twentieth century (such as the Great Lakes and Gulf South) witnessed long-term increases in available moisture, whereas areas

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with divergent rates (such as the Mid-Atlantic and Great Plains) had greater water deficits. Increasing temperatures through the twenty-first century will produce higher PET across the United States; areas where AET similarly escalates will maintain average moisture levels within twentieth-century ranges, but where AET does not correspondingly increase, as in much of the South and West, average conditions will be comparable to those of extreme twentieth-century droughts. The findings highlight the importance of a regional approach to environmental change, as the impacts of climate on water in the United States will be spatially uneven.©

Record 137*

Subject: water – water consumption

Title: **Condensate Harvesting from Large Dedicated Outside Air-Handling Units with Heat Recovery.**

Authors: Painter, Frank L.

Source: ASHRAE Transactions; 2009, Vol. 115 Issue 2, p573-580, 8p

Subject Terms: **Drinking water; water consumption; cooling towers**

Abstract: This paper shows the feasibility of harvesting condensate from large dedicated outdoor air handling units and applying the condensate to effectively reduce the annual projected potable water consumption for a case study building. Condensate production potentials are calculated for three areas in Texas; San Antonio, Houston, and Dallas / Fort Worth. A case study building is presented, for which the production potential is applied. The case study building annual condensate production as well as the annual potable water consumption for the water closets and urinals and cooling tower makeup water is calculated and presented to compare condensate supply and potable water demand. The case study building, which is a medical research laboratory located in San Antonio, TX, was determined to have an annual condensate production of 1,887,031 gallons (7.15×10^6 L), which would normally be sent to the sanitary sewer system. The analysis indicates that the condensate production from the case study building's large dedicated outdoor air handling units can completely supplement the annual water closet and urinal water demand with 1,614,031 gallons (6.12×10^6 L) of excess, which could be used to supplement landscape irrigation system or the entire condensate production could be applied to reduce the cooling tower makeup potable water demand by an estimated 16%.©

Record 138*

Subject: water – water consumption

Title: **The Nexus of Energy and Water in The United States**

Authors: WEBBER, MICHAEL E.

Source: AIP Conference Proceedings; 11/4/2011, Vol. 1401 Issue 1, p84-106, 23p

Subject Terms: **Energy consumption; climatic changes; economic development; economic policy; water supply**

Abstract: This manuscript presents an overview and a relevant framework for thinking about the nexus of energy and water. Here are the key points of this article: • Energy and water are interrelated; we use energy for water and water for energy, • The Energy-water relationship is under strain, and that strain introduces cross-sectoral vulnerabilities (that is, a water constraint can become an energy constraint, and an

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energy constraint can induce a water constraint), • Trends imply that this strain will be exacerbated because of 1) growth in total demand for energy and water, primarily driven by population growth, 2) growth in per capita demand for energy and water, primarily driven by economic growth, 3) global climate change, which will distort the availability of water, and 4) policy choices, by which we are selecting more water-intensive energy and more energy-intensive water.©

Record 139*

Subject: water – water consumption

Title: Urban Water Demand with Periodic Error Correction.

Authors: Bell, David R.; Griffin, Ronald C.

Source: Land Economics; Aug2011, Vol. 87 Issue 3, p528-544, 17p

Subject Terms: Water consumption; municipal water supply; water demand management; statistical measurement

Abstract: Monthly demand for publicly supplied water to U.S. residences and businesses is estimated from a 10-year panel of 167 cities. A periodic error correction model integrates monthly, annual, and long-run time scales. Statistical consistency is validated by unit root tests adapted to the monthly frequency. Water and wastewater price elasticity of demand is estimated by sector, calendar month, and time horizon.©

Record 140*

Subject: water – water consumption

Title: A Horizontal Federalism Solution to the Management of Interstate Aquifers: Considering an Interstate Compact for the High Plains Aquifer.

Authors: Mann, Rex A.

Source: Texas Law Review; Dec2009, Vol. 88 Issue 2, p391-413, 23p

Subject Terms: Water consumption; sustainability; high plains aquifer

Abstract: The article discusses a new strategy for governing the High Plains Aquifer in the U.S., based on the horizontal federalism principle, which is defined as interstate groundwater compact. It states the reasons why the management scheme in the aquifer fosters unsustainable water consumption. The author recommends several approaches to the creation of a groundwater compact. He suggests employing the water compact structure in eastern region as the model for High Plains Aquifer.

Record 141*

Subject: water – water consumption

Title: Future U.S. Water Consumption: The Role of Energy Production.

Authors: Elcock, Deborah

Source: Journal of the American Water Resources Association; Jun2010, Vol. 46 Issue 3, p447-460, 14p

Subject Terms: Water consumption; biomass energy; coal; oils & fats; gas; renewable energy sources; water supply; fossil fuels

Abstract: This study investigates how meeting domestic energy production targets for both fossil and renewable fuels may affect future water demand. It combines projections of energy production developed by the U.S. Department of Energy with estimates of water consumption on a per-unit basis (water-consumption coefficients) for coal, oil,

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gas, and biofuels production, to estimate and compare the domestic freshwater consumed. Although total domestic freshwater consumption is expected to increase by nearly 7% between 2005 and 2030, water consumed for energy production is expected to increase by nearly 70%, and water consumed for biofuels (biodiesel and ethanol) production is expected to increase by almost 250%. By 2030, water consumed in the production of biofuels is projected to account for nearly half of the total amount of water consumed in the production of all energy fuels. Most of this is for irrigation, and the West North Central Region is projected to consume most of this water in 2030. These findings identify an important potential future conflict between renewable energy production and water availability that warrants further investigation and action to ensure that future domestic energy demand can be met in an economically efficient and environmentally sustainable manner.©

Record 142*

Subject: water – water consumption

Title: **Responsible Care: Strategies for Pollution Prevention and Environment Management in E & P Sector of Petroleum Industry.**

Authors: Sharma, J. S.

Source: Proceedings of World Academy of Science: Engineering & Technology; Mar2009, Vol. 51, p376-383, 8p, 9 Charts

Subject Terms: **Water consumption; environmental protection; pollution prevention; petroleum industry; waste minimization; conservation of natural resources**

Abstract: The paper discusses the Oil and Natural Gas Corporation's (ONGC) key initiatives and strategies being followed for pollution prevention and environment management for exploration and production related operations. Waste minimization and estimation of water requirement have been attempted for drilling a 4000 meters and 2200 meters depth of well. Forward planning has been done to reduce the waste generation and to determine the optimum size and shape of the waste pit based on various water consumption practices and hole volume of the well. Calculations and data on water management practices suggest that waste pit of 900 to 1200 M3 and 600 to 900 M3 are sufficient for above depth well. The waste water generation can be reduced by 50%. Ambient air quality and VOC samples were collected monitored and analyzed and are reported to be in the prescribed limits. Effluent analysis of inlet of the effluent and after treatment has been mentioned and a typical example of oil field effluent treatment plant has been discussed. The paper describes mainly the essential of forward planning for oil spill response and management focusing specifically on development of contingency plans including current practices being followed in ONGC and also existing framework on oil spill preparedness. Level of available oil spill preparedness and its status at west and east coast has also been discussed in view of E & P development projects in Mumbai and deep sea of KG basin area.©

Record 143

Subject: water – water consumption

Title: **Residential Water Use.**

Authors: Ferrara, Ida

Source: OECD Papers; 2008, Vol. 8 Issue 2, p153-180, 28p

Subject Terms: **Water consumption; water use; water supply; water conservation**

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Abstract: The article presents a study which examines the factors affecting the utilization of residential water in Organisation for Economic Co-operation and Development (OECD) member countries including Great Britain, Australia, and the U.S. It notes the determinants of the demand for water use including socio-demographic characteristics and weather variables, attitudinal characteristics, and pricing policy measures. It compares the welfare implications of various government policies which are aimed to address extreme water supply shortage.

Record 144*

Subject: water – water consumption

Title: **Water Consumption in the Production of Ethanol and Petroleum Gasoline.**

Authors: Wu, May; Mintz, Marianne; Wang, Michael; Arora, Salil

Source: Environmental Management; Nov2009, Vol. 44 Issue 5, p981-997, 17p, 3 Diagrams, 3 Charts, 6 Graphs

Subject Terms: **Water consumption; ethanol as fuel; petroleum; gasoline; oil sands**

Abstract: We assessed current water consumption during liquid fuel production, evaluating major steps of fuel lifecycle for five fuel pathways: bioethanol from corn, bioethanol from cellulosic feedstocks, gasoline from U.S. conventional crude obtained from onshore wells, gasoline from Saudi Arabian crude, and gasoline from Canadian oil sands. Our analysis revealed that the amount of irrigation water used to grow biofuel feedstocks varies significantly from one region to another and that water consumption for biofuel production varies with processing technology. In oil exploration and production, water consumption depends on the source and location of crude, the recovery technology, and the amount of produced water re-injected for oil recovery. Our results also indicate that crop irrigation is the most important factor determining water consumption in the production of corn ethanol. Nearly 70% of U.S. corn used for ethanol is produced in regions where 10–17 liters of water are consumed to produce one liter of ethanol. Ethanol production plants are less water intensive and there is a downward trend in water consumption. Water requirements for switchgrass ethanol production vary from 1.9 to 9.8 liters for each liter of ethanol produced. We found that water is consumed at a rate of 2.8–6.6 liters for each liter of gasoline produced for more than 90% of crude oil obtained from conventional onshore sources in the U.S. and more than half of crude oil imported from Saudi Arabia. For more than 55% of crude oil from Canadian oil sands, about 5.2 liters of water are consumed for each liter of gasoline produced. Our analysis highlighted the vital importance of water management during the feedstock production and conversion stage of the fuel lifecycle.©

Record 145*

Subject: water – water consumption

Title: **Consumptive water use to feed humanity -- curing a blind spot.**

Authors: Falkenmark, M.; Lannerstad, M.; Savenije, H. H. G.

Source: Hydrology & Earth System Sciences; 2005, Vol. 9 Issue 1/2, p15-28, 14p

Subject Terms: **Water use; water consumption; human rights**

Abstract: Since in large parts of the world it is getting difficult to meet growing water demands by mobilising more water, the discourse has turned its focus to demand management,

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governance and the necessary concern for aquatic ecosystems by reserving an "environmental flow" in the river. The latter calls for attention to river depletion which may be expected in response to changes in consumptive water use by both natural and anthropogenic systems. Basically, consumptive use has three faces: runoff generation influenced by land cover changes; consumptive use of water withdrawn; and evaporation from water systems (reservoirs, canals, river based cooling). After demonstrating the vulnerability to changes in consumptive use under savanna region conditions -- representative of many poverty and hunger prone developing countries subject to attention in the Millennium Development Goal activities -- the paper exemplifies; 1) changes in runoff generation in response to regional scale land cover changes; 2) consumptive use in large scale irrigation systems. It goes on to analyse the implications of seeing food as a human right by estimating the additional consumptive use requirements to produce food for the next two generations. Attention is paid to remaining degrees of freedom in terms of uncommitted water beyond an environmental flow reserve and to potential food trade consequences (so-called virtual water). The paper concludes that a human-right-to-food principle will have major consequences in terms of altered consumptive water use. It will therefore be essential for humanity to address river depletion to avoid loss of resilience of the life support system. This will demand a deep-going cooperation between hydrology, ecology and water governance.©

Record 146*

Subject: water – water consumption

Title: **Water: A critical resource in the thermoelectric power industry**

Authors: Thomas J. Feeley III; Timothy J. Skone; Gary J. Stiegel Jr.; Andrea McNemar; Michael Nemeth; Brian Schimmoller; James T. Murphy; Lynn Manfredo

Source: Energy 33(1):1-11

Subject Terms: **water resource availability; thermoelectric power; water consumption; water withdrawal**

Abstract: Water availability represents a growing concern for meeting future power generation needs. In the United States, projected population growth rates, energy consumption patterns, and demand from competing water use sectors will increase pressure on power generators to reduce water use. Water availability and use also exhibit strong regional variations, complicating the nature of public policy and technological response. The US Department of Energy's (DOE) National Energy Technology Laboratory (NETL) is engaged in a research and development (R&D) program to reduce freshwater withdrawal (total quantity of water utilized) and consumption (portion of withdrawal not returned to the source) from existing and future thermoelectric power generating facilities. The Innovations for Existing Plants (IEP) Program is currently developing technologies in 5 categories of water management projects to reduce water use while minimizing the impacts of plant operations on water quality. This paper outlines the freshwater withdrawal and consumption rates for various thermoelectric power generating types and then estimates the potential benefits of IEP program technologies at both the national and regional levels in the year 2030. NETL is working to protect and conserve water resources while leveraging domestic fossil fuel resources, such as coal, to increase national energy security.

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Record 147**Subject: Environment – nature conservation****Title:** **Lady Bird Johnson Wildflower Center: Implications for Sustainable Development on Water Sensitive Sites.****Authors:** Boyer, Mark**Source:** Landscape Review; 2004, Vol. 9 Issue 1, p54-57, 4p**Subject Terms:** **sustainable development; cultural landscapes; landscape architecture; endemic plants; landscaping industry****Abstract:** The article focuses on the mission of the Lady Bird Johnson Wildflower Center in Austin, Texas. Lady Bird is devoted entirely to native plants. The center functions as an Organizational Research Unit of the University of Texas. Lady Bird Johnson and actress Helen Hayes founded the National Wildflower Research Center in 1982 to protect and preserve North America's native plants and natural landscapes. Officially renamed Lady Bird Johnson Wildflower Center in 1998, the mission of the center has been to increase the sustainable use and conservation of native wildflowers, plants and landscapes.**Record 148*****Subject: Environment – material recovery facilities****Title:** **Sustainable pattern analysis of a publicly owned material recovery facility in a fast-growing urban setting under uncertainty****Authors:** Eric Davila; Ni-Bin Chang**Source:** In Sustainable planning in a semi-arid fast growing region , Journal of Environmental Management 75(4):337-351**Subject Terms:** **material recovery facilities; infrastructure planning; sustainable development; optimization; grey integer programming; uncertainty; decision-making****Abstract:** Sustainable development goals are achievable through the installation of Material Recovery Facilities (MRFs) in certain solid waste management systems, especially those in rapidly expanding multi-district urban areas. MRFs are a cost-effective alternative when curbside recycling does not demonstrate long-term success. Previous capacity planning uses mixed integer programming optimization for the urban center of the city of San Antonio, Texas to establish that a publicly owned material recovery facility is preferable to a privatized facility. As a companion study, this analysis demonstrates that a MRF alleviates economic, political, and social pressures facing solid waste management under uncertainty. It explores the impact of uncertainty in decision alternatives in an urban environmental system. From this unique angle, waste generation, incidence of recyclables in the waste stream, routing distances, recycling participation, and other planning components are taken as intervals to expand upon previous deterministic integer-programming models. The information incorporated into the optimization objectives includes economic impacts for recycling income and cost components in waste management. The constraint set consists of mass balance, capacity limitation, recycling limitation, scale economy, conditionality, and relevant screening restrictions. Due to the fragmented data set, a grey integer programming modeling approach quantifies the consequences of inexact information as it propagates through the final solutions in the optimization process. The grey algorithm screens optimal shipping patterns and an ideal MRF location and

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capacity. Two case settings compare MRF selection policies where optimal solutions exemplify the value of grey programming in the context of integrated solid waste management.

Record 149*

Subject: Environment – material recovery facilities

Title: Optimal design for sustainable development of a material recovery facility in a fast-growing urban setting.

Authors: Chang, Ni-Bin nchang; Davila, Eric; Dyson, Brian; Brown, Ron1

Source: Waste Management; Oct2005, Vol. 25 Issue 8, p833-846, 14p

Subject Terms: industrial wastes; environmental engineering; industrial policy; sustainable development

Abstract: Installing material recovery facilities (MRFs) in a solid waste management system could be a feasible alternative to achieve sustainable development goals in urban areas if current household and curbside recycling cannot prove successful in the long run. This paper addresses the optimal site selection and capacity planning for a MRF in conjunction with an optimal shipping strategy of solid waste streams in a multi-district urban region. Screening of material recovery and disposal capacity alternatives can be achieved in terms of economic feasibility, technology limitation, recycling potential, and site availability. The optimization objectives include economic impacts characterized by recycling income and cost components for waste management, while the constraint set consists of mass balance, capacity limitation, recycling limitation, scale economy, conditionality, and relevant screening constraints. A case study for the City of San Antonio, Texas (USA) presents a vivid example where scenario planning demonstrates the robustness and flexibility of this modeling analysis. It proves especially useful when determining MRF ownership structure. Each scenario experiences two case settings: (1) two MRF sites are proposed for selection and (2) a single MRF site is sought. Cost analysis confirms processing fees are not the driving force in the City's operation, but rather shipping cost. Sensitivity analysis solidifies the notion that significant public participation plays the most important role in minimizing solid waste management expenses. ©

Record 150*

Subject: environment – sustainable buildings

Title: The Value of "Green:" Evidence from the First Mandatory Residential Green Building Program

Authors: Aroul, Ramya R.; Hansz, J. Andrew

Source: Journal of Real Estate Research; Jan-Mar2012, Vol. 34 Issue 1, p27-49, 23p

Subject Terms: Residential real estate; sustainable buildings; dwellings; sustainable architecture; statistical significance; buildings-environmental aspects

Abstract: There has been recent interest in green building and development practices and research. Resulting from growing environmental awareness and concerns, mandatory residential green building programs have been implemented nationally at the municipal level and Texas has passed legislation to create a statewide program.

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However, the impact of greenness on residential property values has not been rigorously evaluated. This study examines residential transaction prices in two cities and finds a statistically significant premium associated with "green" properties. Additionally, there is evidence of a larger premium associated with green properties located in Frisco, Texas, which has the nation's first mandatory residential green building program.©

Record 151*

Subject: environment – sustainable buildings

Title: Green Building Programs -- Are They Really Green?

Authors: Bowyer, Jim L.

Source: Forest Products Journal, Sep2007, Vol. 57 Issue 9, p6-17, 12p

Subject Terms: sustainable buildings -- design & construction; sustainable architecture; building materials; construction industry -- environmental aspects

Abstract: The article examines some of the most notable green building programs of the U.S. and Canada, with focus on how environmentally preferable construction materials are defined and identified within them. The programs include Leadership in Energy & Environmental Design (LEED), Green Globes, the King County Built Green Program in Seattle, the Austin Green Building Program in Texas, the California Green Builder Program, the Build Green Colorado Program, and the Wisconsin Green-Built Program. It is stated that the influence of green building programs in general is positive.

Record 152*

Subject: environment – sustainable buildings

Title: Grassroots Start to Grow

Authors: Ames, Mark; Wills, Mark

Source: ASHRAE Journal; Oct2012, Vol. 54 Issue 10, p98-98, 1p

Subject Terms: building law & legislation; buildings -- environmental engineering; sustainable architecture

Abstract: The article discusses activities by members of the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) in their communities prior to the formal establishment of its Grassroots Government Activities Committee. It cites ASHRAE's participation in Energy Codes Collaborative in Texas, as convened by the Building Codes Assistance Project (BCAP). It also talks about congressional issues like sequestration, taxes and the 2013 National Defense Authorization Act.

Record 153*

Subject: environment – sustainable buildings

Title: Technology and Place: Sustainable Architecture and the Blueprint Farm.

Authors:

Source: Places: Forum of Design for the Public Realm; Fall2002, Vol. 15 Issue 1, p50-53, 4p

Subject Terms: farms; sustainable design; architecture & technology

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Abstract: Part of a special section on the winning projects in the EDRA/Places Awards for 2001 and 2002. In his book *Technology and Place: Sustainable Architecture and the Blueprint Farm*, architecture professor Steven Moore examines the inception and collapse of the Blueprint Farm in Laredo, Texas. The farm was set up to challenge the dominance of corporate agriculture in Texas and to demonstrate the viability of alternative production modes based on small growers, high- margin crops, and sustainable technologies. However, it was abandoned in 1991 in the wake of sharp disagreements over its purpose. Moore argues that the story signals how sustainable places can only emerge from democratic engagement with technological change. His ethnographic and theoretical case study offers fascinating insight into why the practice of sustainability has yet to live up to its potential as an idea.

Record 154*

Subject: environment – sustainable buildings

Title: **Maintain to Sustain**

Authors: Harrison, Bill

Source: ASHRAE Journal; Aug2008, Vol. 50 Issue 8, p20-27, 5p, 2 Color Photographs

Subject Terms: **energy conservation; building -- environmental aspects; sustainable buildings; renewable energy sources; energy consumption; power resources**

Abstract: The article focuses on the energy conservation system of high-performance building. According to the study by the Energy Systems Lab at Texas A&M University, upgrading the operational strategies in buildings can reduce energy consumption by 10% to 40%, therefore, reducing energy and water resource wasting and emissions from generating plants. In order to achieve sustainability, ASHRAE members aim to educate and communicate with building owners regarding the better understanding of energy saving and sustainable building operations.

Record 155

Subject: environment – sustainable buildings

Title: **Green Architecture and the Holistic Montessori School.**

Authors:

Source: NAMTA Journal; Spring2007, Vol. 32 Issue 2, p171-202, 32p

Subject Terms: **Montessori schools; green movement; schools--design & construction; sustainable architecture; sustainable buildings -- design & construction; environmentalism; sustainable buildings; early childhood education**

Abstract: The article discusses the increasing number of U.S. Montessori schools participating in the green movement. Many Montessori schools are integrating the important elements of green building technology and, considering environmental architecture on their school design because of the growing emphasis on the green movement and on the need to develop ecological awareness among young students in U.S. today. Case studies of several Montessori schools who successfully integrated green design concepts in their school environments are also presented. These schools include the Ruffing Montessori School in Cleveland Heights, Ohio, St. Catherine's Montessori in Houston, Texas and the Montessori School of Maui in Makawao, Hawaii.

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Record 156***Subject: environment – sustainable agriculture****Title: Review of Some Recent Developments in Sustainable Shrimp Farming Practices in Texas, Arizona, and Florida.****Authors:** Samocha, Tzachi M.; Hamper, Louis; Emberson, Craig R.; Davis, Allen D.; McIntosh, Dennis; Lawrence, Addison L.; Van Wyk, Peter M.**Source:** Journal of Applied Aquaculture; 2002, Vol. 12 Issue 1, p1-42, 42p, 2 Diagrams, 22 Charts, 7 Graphs**Subject Terms: Sustainable aquaculture; shrimps; sustainable fisheries; sustainable agriculture; aquaculture; environmental degradation**

Abstract: The world shrimp-farming industry is currently experiencing major crop losses due to disease outbreaks, which are often associated with environmental degradation. Such losses can be minimized through the adaptation of technologies that enhance biosecurity and environmental control. Current technologies suggest that a shrimp yield as high as 10 kg/m²/crop can be achieved in indoor, super-intensive, closed recirculation systems in which environmental parameters are controlled. Nevertheless, high construction and operating costs make the financial viability of these systems questionable. Production of shrimp with reduced water exchange in outdoor ponds is another promising method to minimize monetary losses and environmental degradation. Data from commercial shrimp farms in south Texas suggest that significant reduction in water exchange and nutrient release is feasible with no impact on production when an adequate level of aeration is provided. Researchers of the Texas Agricultural Experiment Station, Corpus Christi, Texas, are currently testing other potential management tools for intensification of outdoor pond productions. These trials demonstrated the feasibility of producing a yield of almost 0.9 kg/m² of marketable size shrimp with no water exchange. Inland production of shrimp in low-salinity ground water can provide another potential solution to disease and environmental problems, as production is conducted in isolated areas away from other host species and where effluent water can be used for crop irrigation. Recent studies with this water showed that high-density nursery and grow out of Pacific white shrimp, *Litopenaeus vannamei*, are feasible, with excellent survival and yield.©

Record 157***Subject: environment – sustainable agriculture****Title: Conventionalization, Bifurcation, and Quality of Life: Certified and Non-certified Organic Farmers in Texas****Authors:** Constance, Douglas H.; Jin Young Choi; Lyke-Ho-Gland, Holly**Source:** Southern Rural Sociology; 2008, Vol. 23 Issue 1, p208-234, 27p**Subject Terms: sustainable agriculture; agriculture -- environmental aspects; agriculture – research; community development; environmental protection; environmental quality**

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Abstract: Organic agriculture has been advanced as a production system that improves environmental quality and supports rural community development. Recent developments in organics have called into question both assertions. Researchers have argued that the advent of national-level organic standards has contributed to the conventionalization and bifurcation of organics. Conventionalization refers to the process by which organic agriculture increasingly takes on the characteristics of mainstream industrial agriculture. Bifurcation refers to the process by which the organic agriculture adopts a dual-structure of smaller, lifestyle-oriented producers and larger, industrial-scale producers. This research examines the conventionalization and bifurcation theses through a comparison of certified organic and non-certified organic producers in Texas. We conclude that the case of organics in Texas provides mixed support for the conventionalization thesis.©

Record 158*

Subject: environment – sustainable agriculture

Title: **Combination of multispectral remote sensing, variable rate technology and environmental modeling for citrus pest management**

Authors: Du, Qian; Chang, Ni-Bin; Yang, Chenghai; Srilakshmi, Kanth R.

Source: Journal of Environmental Management; Jan2008, Vol. 86 Issue 1, p14-26, 13p

Subject Terms: **agriculture; crop management; sustainable agriculture; soil pollution; pollution prevention; environmental protection**

Abstract: The Lower Rio Grande Valley (LRGV) of south Texas is an agriculturally rich area supporting intensive production of vegetables, fruits, grain sorghum, and cotton. Modern agricultural practices involve the combined use of irrigation with the application of large amounts of agrochemicals to maximize crop yields. Intensive agricultural activities in past decades might have caused potential contamination of soil, surface water, and groundwater due to leaching of pesticides in the vadose zone. In an effort to promote precision farming in citrus production, this paper aims at developing an airborne multispectral technique for identifying tree health problems in a citrus grove that can be combined with variable rate technology (VRT) for required pesticide application and environmental modeling for assessment of pollution prevention. An unsupervised linear *unmixing* method was applied to classify the image for the grove and quantify the symptom severity for appropriate infection control. The PRZM-3 model was used to estimate environmental impacts that contribute to nonpoint source pollution with and without the use of multispectral remote sensing and VRT. Research findings using site-specific environmental assessment clearly indicate that combination of remote sensing and VRT may result in benefit to the environment by reducing the nonpoint source pollution by 92.15%. Overall, this study demonstrates the potential of precision farming for citrus production in the nexus of industrial ecology and agricultural sustainability.©

Record 159*

Subject: Environment – sustainable agriculture

Title: **Sustainability of agroecosystems in semi-arid grasslands; simulated management of woody vegetation in the Rio Grande Plains of southern Texas and northeastern Mexico**

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Authors: Grant, W. E.; Hanilton, Wayne T.; Quintanilla, Esteban
Source: Ecological Modelling; Dec1999, Vol. 124 Issue 1, p29-42
Subject Terms: Ecology; sustainable agriculture; biotic communities
Abstract: We describe a model that simulates use of chemical treatments, mechanical treatments (roller chopping and root plowing), and fire to manage woody vegetation in the Rio Grande Plains of southern Texas and northeastern Mexico. The model consists of two submodels representing dynamics of woody and herbaceous vegetation, respectively. Percent canopy cover of woody vegetation changes as the result of application of management schemes. Aboveground biomass of herbaceous vegetation changes as the result of differences in rates of net primary production, senescence, decomposition, and losses due to grazing and fire. The model is represented as a compartment model based on difference equations with a time step of 1 month. Model predictions of changes in canopy cover of woody vegetation, number of acres required to support a cow, and net production of herbaceous vegetation following application of each of the four treatments are similar to typical 25-year post-treatment response curves for the Rio Grande Plains. Simulation results suggest that the period of opportunity for effective use of fire to manage woody vegetation and sustain production of herbaceous vegetation is longest following root plowing, intermediate following use of chemicals, and shortest following roller chopping. In each case, the efficacy of fire in reducing canopy cover of woody vegetation diminishes rapidly as percent canopy cover increases from roughly 30/50%. ©

Record 160*

Subject: environment – sustaining agriculture

Title: Sustaining agriculture in drought years.

Authors: De Quattro, Jim

Source: Agricultural Research, Jan1997, Vol. 45 Issue 1, p4, 6p, 8 Color Photographs

Subject Terms: Conservation tillage; sustaining agriculture

Abstract: Focuses on US Agricultural Research Service (ARS) scientists' development and testing of a conservation tillage system during a drought period in Texas. Details of the conservation tillage system; Drought's testing of conservation tillage technology; Farmers' implementation of their own field tests.

Record 161*

Subject: environment - habitat conservation

Title: Modeling Potential Coastal Vegetation Response to Sea Level Rise and Storm Surge on Estuarine Peninsulas.

Authors: March, Rosaleen Grace; Smith, Elizabeth Hovey

Source: Journal of Coastal Research; Sep2012, Vol. 28 Issue 5, p993-1007, 15p, 2 Diagrams, 2 Charts, 6 Graphs, 7 Maps

Subject Terms: Sea level; environmental aspects; vegetation dynamics; estuarine health; peninsulas; storm surges; habitat conservation; Geographic information systems

Abstract: Upland vegetation changes in response to sea level rise and storm surge were

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evaluated on two peninsulas adjacent to the Copano Bay-Aransas Bay system and within a semiarid coastal environment in south-central Texas. Potential natural land cover models were created in a geographical information system (GIS) using soil data attributes and elevation data to compare land cover shifts under various sea level rise and storm surge scenarios. Ecological sites used as mapping units were related to land cover classes by generating a classification crosswalk. Crosswalks were expanded in the GIS to define how each land cover type would change with each meter of estuarine inundation using digital elevation models. Potential natural land cover maps show that grassland and/or evergreen are concentrated in the center of both peninsulas with grassland lining the perimeter. Mainland connections of Lamar and Live Oak peninsulas are primarily salty prairie and grassland, respectively. On Lamar Peninsula, a 1-m sea level rise results in a conversion of salty prairie (-99%) to estuarine emergent (+97%). A total rise of 3 m reduces grassland by 99% and evergreen forest by 71%. A 1-m sea level rise on Live Oak Peninsula eliminates over half of the salty prairie, which becomes estuarine emergent class. These values indicate the vegetation that will at least be temporarily impacted by storm surge. Higher elevations and steeper slopes on Live Oak Peninsula result in lower inundation values for upland habitats as compared with Lamar Peninsula. Sea level rise and storm surge events will continue to be a major influence on vegetative composition in estuarine environments and should be considered in future land use and conservation planning. ©

Record 162*

Subject: environment - habitat conservation

Title: Atascosa Germplasm Texas Grama

Authors: Smith, Forrest S.; Maywald, Paula D.; Ocumpaugh, William R.; Lloyd-Reilley, John; Maher, Shelly D.; Pawelek, Keith A.

Source: Native Plants Journal (Indiana University Press); Fall2010, Vol. 11 Issue 3, p299-304, 6p, 2 Color Photographs, 1 Map

Subject Terms: Grasses; Germplasm resources; revegetation; habitat conservation; germination

Abstract: The article probes into the release of a blend of germplasms of Texas grama in South Texas. The release of the germplasm, comprised of 6 accessions, was aimed at roadside vegetation and wildlife habitat restoration in the area. The selection process involved the evaluation of perennial habit, seed germination and good performance at various locations.

Record 163*

Subject: environment - habitat conservation

Title: Catarina Blend Bristlegrass

Authors: Lloyd-Reilley, John; Maher, Shelly D.; Ocumpaugh, William R.; Maywald, Paula D.; Smith, Forrest S.

Source: Native Plants Journal (Indiana University Press); Fall2010, Vol. 11 Issue 3, p305-309, 5p, 2 Color Photographs, 1 Map

Subject Terms: Setaria; Germplasm, resources; rangelands; habitat conservation

Abstract: The article probes into the release of four selected germplasm of bristlegrass in South Texas. The release of the Catarina blend bristlegrass, comprised of a mix of 4

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bristlegrass releases, was aimed at rangeland plantings and wildlife habitat enhancement plantings in the Rio Grande Plain of Texas. The selection process involved extensive evaluation of seeds from various locations.

Record 164*

Subject: environment – grassland restoration

Title: Webb Germplasm Whiplash Pappusgrass

Authors:

Source: Native Plants Journal (Indiana University Press); Fall2010, Vol. 11 Issue 3, p275-280, 6p, 2 Color Photographs, 1 Map

Subject Terms: Grasses; Germplasm resources; soil conservation; grassland restoration; plant physiology

Abstract: The article discusses the release of a selected germplasm of whiplash pappusgrass in South Texas. The Webb Germplasm release was aimed at rangeland seeding, saline soil revegetation and wildlife habitat restoration planting. The selection process involved the visual evaluation of plant characteristics and the conduct of germination tests of seeds from various locations.

Record 165*

Subject: environment – declining amphibian populations

Title: Short-term Response of Herpetofauna to Various Burning Regimes in The South Texas Plains

Authors: Ruthven, DC; Kazmaier, RT; Janis, MW

Source: SOUTHWESTERN NATURALIST; DEC, 2008, 53 4, p480-p487, 8p.

Subject Terms: Declining amphibian populations; lizards; vegetation

Abstract: Data on effects of fire on herpetofauna generally are lacking. With increased use of prescribed fire to manage rangelands in South Texas for wildlife and livestock, a better understanding of effects of fire on the herpetofauna is needed. We investigated effects of combinations of winter and summer prescribed fire on rangeland sites on the Chaparral Wildlife Management Area in southern Texas. Dormant-season fires had little effect on diversity and abundance of the herpetofauna. Inclusion of growing-season fire into the burning regime tended to increase diversity and abundance of grassland species, such as the six-lined racerunner (*Cnemidophorus sexlineatus*). Although our experimental design limits interpretation of results to the study site, our data suggest that prescribed fire may be used to manage rangelands in South Texas without negative effects on the herpetofauna. A varied burning regime is recommended to increase herpetofaunal diversity.

Record 166

Subject: environment – wildlife conservation

Title: Reduced genetic diversity and isolation of remnant ocelot populations occupying a severely fragmented landscape in southern Texas.

Authors: Janečka, J. E.; Tewes, M. E.; Laack, L. L.; Caso, A.; Grassman, Jr, L. I.; Haines, A. M.; Shindle, D. B.; Davis, B. W.; Murphy, W. J.; Honeycutt, R. L.

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Source: Animal Conservation; Dec2011, Vol. 14 Issue 6, p608-619, 12p

Subject Terms: Ocelot; wildlife conservation; animal genetics

Abstract: The ocelot *Leopardus pardalis* has become a conservation priority in the US as a result of severe population decline and loss of habitat during the 20th century. Only two small populations remain in this country. Their short-term viability is threatened by the disappearance of dense thornshrub communities, human-caused mortality and demographic stochasticity. The influence these factors have on ocelot persistence must be considered to develop effective conservation initiatives. We therefore examined neutral genetic diversity and connectivity among ocelots in the US and northeastern Mexico using 25 autosomal microsatellites and a 395-bp segment of the mitochondrial control region. Genetic variation was lowest in the population occurring on Laguna Atascosa National Wildlife Refuge, Texas (autosomal microsatellite $HE=0.399$ and mtDNA-haplotype diversity=0) and highest in northeastern Mexico (0.637 and 0.73, respectively), while intermediate on private lands in Willacy County, Texas (0.553 and 0.252, respectively). Significant genetic differentiation between the two Texas populations was observed, despite their close proximity (~30 km). Both populations were also significantly divergent from northeastern Mexico. The absence of any detectable gene flow implies that the human modified landscape of the Lower Rio Grande Valley in southern Texas acts as a strong barrier to ocelot movement, disrupting metapopulation dynamics and contributing to loss of diversity. As a consequence, continued genetic erosion among the Texas populations is expected. The lack of movement through the fragmented landscape also suggests it is unlikely ocelots will recolonize unoccupied habitat patches along the Lower Rio Grande and the delta interior where agriculture and urban land uses predominate. The continued rapid development will exacerbate this problem. These factors threaten the persistence of the Texas populations and limit their recovery. Translocations are necessary to link ocelot populations in the US.©

Record 167*

Subject: environment – wildlife conservation

Title: Habitat Partitioning Bysympatric Ocelots and Bobcats: Implications for Recovery of Ocelots in Southern Texas

Authors: HORNE, JON S.; HAINES, AARON M.; TEWES, MICHAEL E.; LAACK, LINDA L.4

Source: Southwestern Naturalist; Jun2009, Vol. 54 Issue 2, p119-126, 8p, 1 Chart, 2 Graphs

Subject Terms: Ocelot; bobcat; habitat; environmental sciences; wildlife conservation; plant canopies

Abstract: Populations of ocelots (*Leopardus pardalis*) have declined during the past century due mainly to loss of habitat resulting in the ocelot being listed as endangered by the United States Fish and Wildlife Service. In southern Texas, the northern distribution of the ocelot overlaps the southern distribution of the bobcat (*Lynx rufus*). Because bobcats could adversely affect populations of ocelots through interspecific competition, we examined habitat selection of sympatric ocelots and bobcats to determine if habitat partitioning could be functioning to reduce interspecific interactions. Using radiotelemetry, we analyzed macro-scale (vegetative communities) and micro-scale (structural components) selection of habitats by sympatric ocelots and bobcats on Laguna Atascosa National Wildlife Refuge, Cameron

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County, Texas. We looked for differences in placement of home ranges within the general study area, selection of cover within home ranges, and use of structural components of vegetation within types of cover. There was substantial evidence for habitat partitioning with ocelots selecting areas with >75% canopy cover, while bobcats selected areas with <75% canopy cover. Thus, coexistence between these two species might be facilitated by resource partitioning of habitat.©

Record 168*

Subject: environment – wildlife conservation

Title: A comparison of coyote ecology after 25 years: 1978 versus 2003.

Authors: Young, J. K.; Andelt, W. F.; Terletzky, P. A.; Shivik, J. A.4

Source: Canadian Journal of Zoology; Apr2006, Vol. 84 Issue 4, p573-582, 10p

Subject Terms: Coyote; ecology; wildlife management areas; wildlife conservation; animal population; animal ecology

Abstract: Most ecological studies of coyotes are of short duration and studies are generally never repeated, thus the opportunity to compare changes in coyote (*Canis latrans* Say, 1823) ecology over time is rare. We compared coyote home ranges, activity patterns, age, and diet at the Welder Wildlife Refuge in south Texas between 1978-1979 and 2003-2004 (25 years later). The Minta index of overlap between 1978 and 2003 home ranges was 51.7 ± 7.0 ($n = 7$), much greater than the Minta index value based on randomized tests (28.7 ± 8.6), indicating similar spatial patterns between time periods. The Minta index was 12.3 ± 6.2 ($n = 7$) for core areas, whereas the Minta index value based on randomized tests was 4.0 ± 3.0 . Although overall diets were similar between 1978 and 2003, we detected some differences in prey species consumed. Activity patterns were similar between the two study periods, with peaks in movement occurring around sunrise and sunset. There was no difference in the mean age between the two populations ($P = 0.44$, $n = 68$, $t[66] = 2.00$). Our findings suggest that population features, such as home-range position and age structure, are similar between extended time periods, while individual-level patterns, such as the prey species consumed and distribution of locations within a home range, are dynamic and may reflect changes in the local environment.©

Record 169*

Subject: environment – wildlife conservation

Title: Fifty-Five Years of Fish Kills in Coastal Texas.

Authors: Thronson, Amanda; Quigg, Antonietta

Source: Estuaries & Coasts; Sep2008, Vol. 31 Issue 4, p802-813, 12p, 3 Charts, 2 Graphs

Subject Terms: Wildlife conservation; fish kills; industrialization

Abstract: The designation of Texas as a "hotspot" for fish mortalities relative to the other 22 coastal US states is of serious concern for scientists, resource managers, and the public alike. We investigated the major sources and causes of fish kills in coastal Texas from 1951 to 2006. During this 55-year period, more than 383 million fish were killed, 72% of which were Gulf menhaden (*Brevoortia* spp.). We examined the relationships between climate and the physical features of Texas bays and estuaries as well as the consequences of high-density industrialization and urbanization along several coastal

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centers on fish kills, including the impact of eutrophication, algal blooms (toxic and nontoxic), and hypoxia. Galveston and Matagorda Bays had the highest number of fish kill events and total number of fish killed. The largest number of fish kill events and the highest number of fish killed occurred during the warmest months, particularly in August. The leading cause of fish kills was found to be low dissolved oxygen concentrations caused by both physical and biological factors. From 1958 to 1997, about two thirds of the mortalities from low oxygen concentrations were caused by human activities. With the population predicted to double in Texas by 2050, mostly along the coastal areas, natural resources will require additional protection. Further increases in nutrient loading are expected in areas unable to keep up with construction of sewage treatment facilities. Defining the sources and causes of fish kill events in Texas will allow better management and conservation efforts. ©

Record 170*

Subject: environment – wildlife conservation

Title: Conservation biogeography of the US-Mexico border: a transcontinental risk assessment of barriers to animal dispersal.

Authors: Lasky, Jesse R.; Jetz, Walter; Keitt, Timothy H.

Source: Diversity & Distributions; Jul2011, Vol. 17 Issue 4, p673-687, 15p, 1 Diagram, 2 Charts, 3 Graphs, 2 Maps

Subject Terms: **Wildlife conservation; species diversity; biogeography**

Abstract: Humans have dramatically transformed landscapes along the US-Mexico border. We aim to assess the risk of barriers that may significantly impede animal migrations within this ecologically sensitive region. United States and Mexico. We examined the intersection of current and possible future barriers along the border with the geographic ranges of 313 amphibian, reptile and non-volant mammal species. We considered the areas of intensive human land use and ~ 600 km of pedestrian fence as current barriers along the border. We evaluated the impacts of two scenarios of dispersal barriers - continuation of existing and construction of new barriers - and identified species vulnerable to global and local extinction. Among the species most at risk from current barriers are four species listed as threatened globally or by both nations, 23 species for which the larger of their two national subranges is < 10 km and 29 species whose ranges cross the border only marginally. Three border regions, California, Madrean archipelago and Gulf coast, emerge as being of particular concern. These regions are characterized by high overall species richness and high richness of species at risk from existing barriers and from construction of potential new barriers. New barriers along the border would increase the number of species at risk, especially in the three identified regions, which should be prioritized for mitigation of the impacts of current barriers. The species we identified as being potentially at risk merit further study to determine impacts of border dispersal barriers. ©

Record 171*

Subject: environment – wildlife conservation

Title: Home Range and Landscape Use of Coyotes in A Metropolitan Landscape: Conflict or Coexistence?

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Authors: GEHRT, STANLEY D.; ANCHOR, CHRIS; WHITE, LYNSEY A.
Source: Journal of Mammalogy; Oct2009, Vol. 90 Issue 5, p1045-1057, 13p, 5 Charts, 3 Graphs, 3 Maps
Subject Terms: **Habitat; wildlife conservation; coyote; home range (animal geography)**
Abstract: An understanding of how top mammalian carnivores respond to urbanization is important for conservation and management of human--wildlife conflicts. Coyotes (*Canis latrans*) have recently become more prevalent in many metropolitan areas; however, their apparent success is poorly understood. We estimated home-range size and selection of land-use types for coyotes in a heavily urbanized landscape, with a particular focus on responses of coyotes to those parts of the urban landscape with high levels of human development or activity. Mean (\pm SE) annual home ranges of transient coyotes ($\bar{X} = 26.80 \pm 2.95 \text{ km}^2$) were larger than those of resident coyotes ($\bar{X} = 4.95 \pm 0.34 \text{ km}^2$), and home-range size for resident coyotes did not vary among seasons or between age and sex classes. Although most home ranges were associated with natural patches of habitat, there was considerable variation among coyotes, with some home ranges entirely lacking patches of natural habitat. Within home ranges, coyotes typically avoided land-use types associated with human activity (i.e., Residential, Urban Grass, and Urban Land) regardless of coyote characteristics, seasons, and activity periods. Few coyotes were nuisances, and conflicts occurred when coyotes were sick or exposed to wildlife feeding by humans. We found little evidence that coyotes were attracted to areas associated with human activity, despite at times having home ranges located in heavily developed areas. ©

Record 172*

Subject: environment – wildlife conservation

Title: **Germination and early growth traits of 14 plant species native to northern Mexico**

Authors: Flores, J; Jurado, E

Source: SOUTHWESTERN NATURALIST; MAR, 1998, 43 1, p40-p46, 7p.

Subject Terms: **Tamaulipan thornscrub; biodiversity; conservation; fuelwood**

Abstract: Germination characteristics for 24 species and survival of seedlings for 12 species of plants from the Tamaulipan thornscrub of northern Mexico were studied. Experiments were conducted to compare rate and extent of germination at mean summer (28 degrees C) and winter (12 degrees C) temperatures. Seedlings survival was studied under three light conditions: (i) direct sunlight, (ii) under artificial shade, and (iii) under thornscrub. Only 14 species had sufficient germination to allow for statistical analysis. Most species germinated in less than 10 days. Some species required scarification to promote germination. All species germinated at mean summer temperature and most germinated at mean winter temperature. Most species had a tendency to establish more seedlings in artificial shade. Seedlings in artificial shade showed a trend to be taller than those established under direct sunlight or under thornscrub.

Record 173

Subject: environment – biodiversity conservation

Title: **Reflectance characteristics and remote sensing of a riparian zone in south Texas**

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Authors: Everitt, JH; Yang, C; Escobar, DE; Lonard, RI; Davis, MR
Source: SOUTHWESTERN NATURALIST; SEP, 2002, 47 3, p433-p439, 7p.

Subject Terms: Biodiversity conservation; ecology

Abstract: This paper presents data on utilizing remote sensing technology for characterizing a riparian zone in southern Texas. Radiometric ground reflectance measurements, color-infrared aerial photography, and computer image processing techniques were conducted for this study. Reflectance measurements were made on 8 dominant vegetation types, soil, and water. Spectral measurements were made in the visible green (0.52-0.60 μm), visible red (0.63-0.69 μm), and near-infrared (0.76-0.90 μm) wavelengths. Reflectance values differed significantly ($P = 0.05$) among the vegetation, soil, and water parameters at all 3 wavelengths. Differences in reflectance among the vegetation cover types were attributed to variable foliage coloration and vegetative density. A color-infrared photograph of the study area showed that many of the ecological surface types could be readily distinguished. An unsupervised computer classification of the photograph identified 8 ground classes. An accuracy assessment performed on the classification showed an overall accuracy of 88%.

Record 174

Subject: environment – forest

Title: Seasonal variation in herpetofauna abundance and diversity in the south Texas plains

Authors: Ruthven, DC; Kazmeier, RT; Gallagher, JF; Synatzske, DR

Source: SOUTHWESTERN NATURALIST; MAR, 2002, 47 1, p102-p109, 8p.

Subject Terms: Declining amphibian populations; forest; lizards

Abstract: From the text...'Sampling of herpetofauna during spring and summer may be sufficient to obtain adequate estimates of species richness when comparing habitats or treatments. We recommend sampling from spring through fall if acquiring data on species diversity and abundance are desired. Soil and cover boards in pitfalls provide a good measure of protection from predation and the elements. A means of providing complete shade of pitfalls during summer is recommended to reduce heat-related mortalities. The threat of predation and weather-related mortalities supports the need of checking arrays at least twice daily. If mortalities of amphibians such as *G. olivacea* are a concern, morning checks should be conducted prior to sunrise. Our study site is located in the west-central region of the south Texas plains and is typical of much of south Texas. However, activity patterns of herpetofauna may vary throughout the region as a result of climatic variables. As indicated by our captures of *G. olivacea*, precipitation may influence activity of amphibians. Although precipitation patterns in south Texas are consistently bimodal, rainfall can be highly variable from one location to another (Norwine and Bingham, 1985). Variation in temperatures throughout south Texas, especially during winter, also may influence herpetofauna activity. Mean daily winter temperatures increase by 6°C along a north to south gradient throughout the region. Lack of activity during winter may expose certain species to direct harm from habitat management activities, although long-term benefits of management activities such as prescribed fire may outweigh any direct mortality (Russell et al., 1999). Further investigation into the wintering habits of

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reptiles and amphibians and their response to management activities in the South Texas Plains is warranted.' © Southwestern Association of Naturalists. Abstract reproduced by permission.

Record 175

Subject: sustainability education

Title: Positive Energy: Green-Jobs Training Prepares Students for New Careers

Authors: Coyle, Kevin ; Flynn, Maria

Source: Community College Journal, v81 n2 p40-43 Oct-Nov 2010. 4 pp.

Subject Terms: **employment opportunities; community colleges; higher education; labor force development; sustainable development; conservation (environment); ecology; quality of life; partnerships in education; energy; higher education; two year colleges**

Abstract: The emerging green economy will create not just jobs, but--if done right--career opportunities across the United States as green manufacturing, green products, and green services fuel demand for workers at all skill levels. Sixty-one percent of the members of the Association of Energy Engineers report a growing shortage of qualified professionals in the field, and 37 percent say they plan to retire in the next 10 years. According to the Center for American Progress, clean energy will be one of the largest industries in the country by 2020, valued as high as \$2.3 trillion per year. At the center of this unprecedented opportunity are the nation's nearly 1,200 community and technical colleges. Good work is already under way in several states, including Illinois, Michigan, North Carolina, and Texas. In this article, the authors detail a new Greenforce Initiative designed to spur green-jobs education. They present examples that illustrate how community colleges in some states implement the program and provide opportunities to participate in the emerging green economy.

Record 176

Subject: sustainability education

Title: Examining the Impacts of a Graduate Course on Sustainable Development Using Ecological Footprint Analysis

Authors: Ryu, Hyung-Cheal ; Brody, Samuel D.

Source: International Journal of Sustainability in Higher Education, v7 n2 p158-175 2006. 18 pp.

Subject Terms: **control groups; research design; colleges; sustainable development; graduate study; interdisciplinary approach; pretests posttests; instructional effectiveness; socioeconomic status; student attitudes; student behavior; attitude change; higher education**

Abstract: The purpose of this study is to use ecological footprint analysis (EFA) in an interdisciplinary graduate level course on sustainable development to better how education can facilitate learning and transform the perceptions and behavior of class participants. Design/methodology/approach: This study uses an untreated control group research design with a pre-test and post-test to measure and explain the change in the EF of students enrolled in a graduate course on sustainable development taught at Texas A&M University in the spring of 2004. We uses the study test of means and multivariate regression analysis to make statistical conclusions

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about the degree to which education on sustainability affects the way students act and also to identify the major factors driving this behavioral change. Findings: Results indicate that that graduate-level education can significantly increase students' sustainable behavior as measured by their ecological footprints (EF) and that specific socioeconomic and proximity-based variables contribute to this observed phenomenon. Practical implications: This study provides insights into the effectiveness of teaching sustainable development courses at institutions of higher education by examining the change in specific EF components and identifying variables which help predict the change in EFs over the course of the semester. Originality/value: This study uses an empirically-driven, quantitative approach to understand the degree to which graduate-level coursework on the topic of sustainable development transforms the perceptions and behavior of class participants. (Contains 1 figure, 6 tables, and 3 notes.)©

Record 177*

Subject: sustainability education

Title: Undergraduate Agriculture Curricula in Sustainability: An Evaluation Across Borders.

Authors: Borsari, Bruno; Vidrine, Malcolm F.

Source: Journal of Sustainable Agriculture, 2005, Vol. 25 Issue 4, p93-112, 20p, 4 Charts

Subject Terms: sustainable agriculture; agriculture; alternative agriculture; agricultural systems; agricultural education; agricultural students

Abstract: This paper focused on the evaluation of undergraduate study programs in agriculture for a selected group of universities from Louisiana and Texas in the US, and France and Italy. Eight samples of graduating students (n = 20) from each institution participated in a quantitative survey. Qualitative data were collected through interviews with sixteen respondents (one faculty member and one administrator of each university). A document analysis review provided more qualitative data on the foundations of agricultural curricula at these institutions and other schools around the world. Such a variety of data collection methodologies allowed for a triangulation of the results, which enhanced the validity of the study. Every university recognized the emergence of a sustainable agriculture model, despite the curricular diversity across national borders and the different levels of sensitivity toward the issue. Although more work is needed to incorporate sustainable agriculture principles in the agricultural curriculum, various recommendations are suggested. This work contributes to the promotion of an emerging sustainable agriculture philosophy.©

Record 178

Subject: sustainability education

Title: Putting Green to Work on Your Campus

Authors: Ellis, Martha

Source: Community College Journal, v79 n2 p36-37 Oct-Nov 2008. 2 pp.

Subject Terms: community colleges; college presidents; sustainable development; administrator role; change strategies; conservation (environment); educational facilities improvement; environmental education; recycling; two year colleges

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Abstract:

Conferences, publications, media, and state mandates provide a plethora of information about community colleges "going green." Indeed, many community college presidents have signed the American College & University Presidents Climate Commitment, a pledge to reduce the carbon footprints of their institutions. But the task is not easy. Each community college is different and faces the political realities of the community it serves. Each president must decide how to address significant challenges, including lack of money, state mandates, the retrofitting of older facilities, rising utility costs, and the question of how, when, and whether to move forward with sustainability initiatives. As the former president at Lee College in Baytown, Texas, the author provides steps taken at Lee that could make a difference at one's institution.