

# South Texas Research Network for Science, Engineering, and Education for Sustainability

A Proposal to NSF Research Coordination  
Networks – Science, Engineering and Education  
for Sustainability (RCN-SEES) Program

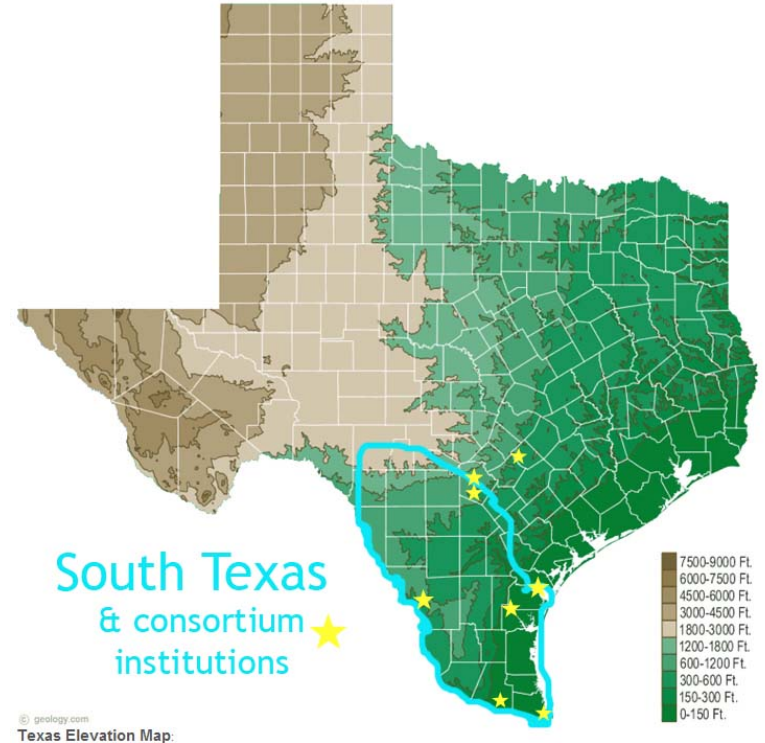
Due May 24, 2011

# South Texas Network for Science, Engineering, and Education for Sustainability



# The South Texas Region

South Texas, which runs from the northern edge of the Nueces River basin to the south-most point of Texas, will be dramatically affected by climate change, and yet preparation has been virtually nil for the inevitabilities of rising sea levels, increasing land temperatures, prolonged drought and radical shifts in weather patterns. Semi-arid South Texas will become both wetter, as sea levels rise along the coast, and drier, as increasing land temperatures affect freshwater resources.



# The South Texas Region

South Texas comprises a broad range of geographical features, from the Gulf of Mexico over developed and undeveloped areas of Padre and Mustang islands, through the estuarine systems of the Laguna Madre, Oso, Corpus Christi and Nueces bays; and up the Nueces riverine system through semiarid brush lands that climb eventually to the Edwards Plateau.



# The South Texas Region

The South Texas economy is diverse though dominated by oil and gas exploration and refining, large-scale dry-land crop farming and ranching. The region includes major ports in Brownsville and Corpus Christi principally devoted to bulk cargoes of petrochemical products, feed grains and cotton. The Port of Corpus Christi also includes a substantial petrochemical refining capacity. Tourism is another significant economic sector, a significant component of which is eco-tourism.



# The South Texas Region

There are wide disparities of wealth in South Texas, from abject rural and urban poverty to relatively high degrees of affluence and influence connected in various ways to the oil and gas industry. Overall, the region less affluent than the rest of Texas. The median income for all Texas households in 2005 was about \$42,000, compared with a range of \$39,000 in Corpus Christi to \$25,000 in the Rio Grande Valley.



# The South Texas Region

Hispanics are the overwhelming majority population regionally (81 percent) and represent most of the region's poor. Despite a long history of racial discrimination and political disenfranchisement, a strong Hispanic middle class has emerged since World War II. Two major Hispanic civil rights groups were founded in Corpus Christi, the League of United Latin American Citizens (LULAC) and the American G.I. Forum. Even though Hispanics have been politically ascendant in South Texas for the past 40 years, Hispanic and non-Hispanic populations remain largely segregated in the cities and towns of South Texas. All of South Texas' institutions of higher education are bona fide Hispanic-serving institutions (HSI).



# The South Texas Region

Hispanics are the fastest growing and largest minority population in the United States. Socio-culturally, this ethnic group has tended to be slow to embrace the values of higher education, despite the leadership of major Hispanic civil-rights groups such as LULAC and the G.I. Forum. HSI's have been actively engaged in closing the educational gaps, but with specific reference to the goals of Science, Engineering and Education for Sustainability (SEES), South Texas must engage not an ethnic minority but an overwhelming *majority* of its population to ensure that it has public awareness, academic knowledge and workforce capacities sufficient to meet the looming challenges of climate change.

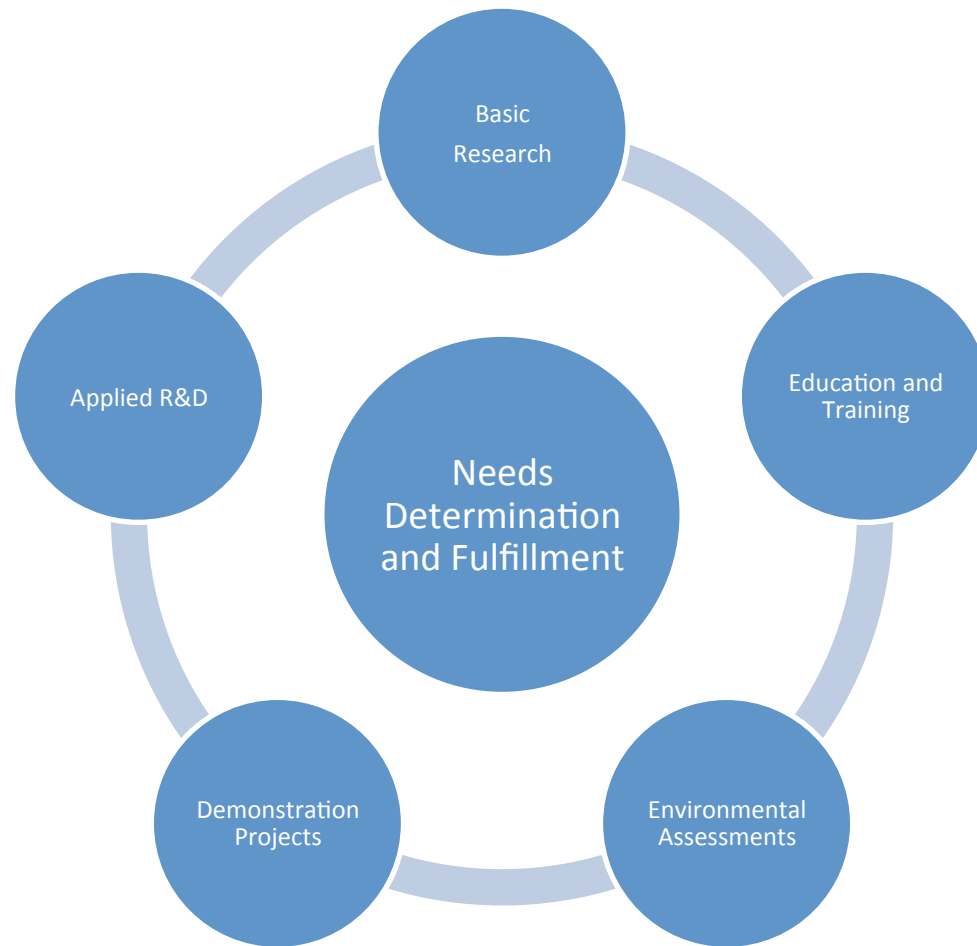




# The Consortium Will Focus on the Multi-Faceted Nexus Among Energy, the Environment, and Society

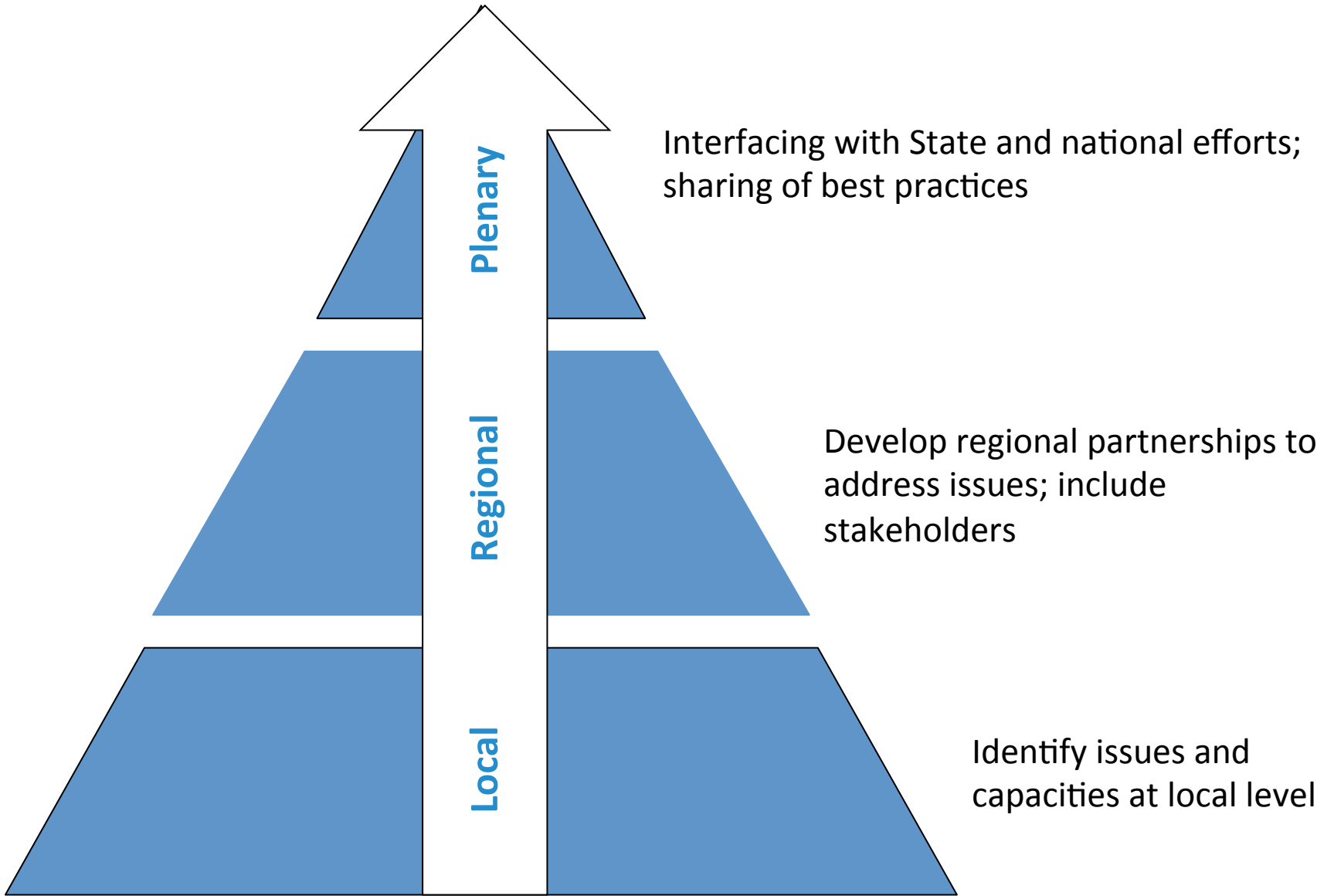
- Developing science and engineering capabilities required for sustainable alternative energy systems
- Evaluating environmental impacts associated with implementing and not implementing alternatives
- Educating the next generation of scientists and engineers to support sustainable energy development
- Engaging a spectrum of societal stakeholders by
  - Communicating the current situation and future conditions
  - Eliciting insights and inputs, with a focus on the unique demographics of South Texas
  - Identifying required policies and regulations
- Considering “environmental ethics,” the human aspects of the nexus, including impacts on ecosystems, cultures, and lifestyles

# The Consortium Brings a Spectrum of Capabilities Together to Identify and Fulfill SEES Needs



# The Consortium will Determine and Fulfill SEES Needs Using a Wide Array of Tools

- Science and engineering analyses to identify technology gaps impeding sustainable energy development
- Systems studies of current and alternative energy deployments
- Environmental assessments, including impacts of implementing and not implementing alternatives
- Stakeholder workshops to elicit perspectives and collect data
- Demographic evaluations, including unique South Texas perspectives as a forerunner to Nationwide trends
- Public outreach and education initiatives
- Policy evaluations and regulatory analyses



**Workshop Structure**