

Water-Energy-Food Nexus Initiative



The interconnection of water, energy and food resources is highly complex and the availability of these resources is increasingly stressed by climatic, social, political, economic, demographic, technologic and other pressures. Sustainably addressing these challenges requires a better understanding of the nexus formed by the interconnections between the resources and will lead to a more equitable allocation and improved management of them.

The Texas A&M University Water-Energy-Food Nexus Initiative is composed of Texas A&M University scientists who are committed to finding solutions to the nexus grand challenges. These scientists and educators will make up multidisciplinary teams that share their skills, knowledge and scientific abilities to produce the necessary analytics, grounded in state-of-the-art science, and able to provide a platform to facilitate inclusive stakeholder dialogues at local, regional and global levels.

This informed dialogue will enable a better understanding of the full life-cycle footprints of food, water and energy resources, their products and services. This dialogue will enable improved, science-based, management of these critical resources and will assist policy makers in planning effectively to address the anticipated shortfalls in these primary resources in a changing world.



Initiative's Goals

- Facilitate science-based policy
- Raise awareness among academe, society, government and industry for holistic approaches to address grand challenges and sustainable development goals
- Identify and respond to national and global opportunities in research, education, outreach and policy implementation
- Assist in the effective management of primary resources

Launch Activities - San Antonio Case Studies in support of the planning for Water-Energy-Food Resources Nexus in San Antonio and surrounding regions. Focus topics for these case studies include Data and Modeling, Energy Efficient, Low Cost Water Supply, Conservation & Management Alternatives, WEF Governance: financing and management structures, Tradeoffs and Decision Support Tools, Water for Food, Water for Energy

For information further information contact: wefnexus@tamu.edu

Texas A&M WEF Nexus Initiative Leadership Team

- **Rabi H. Mohtar, Texas A&M Engineering Experiment Station (TEES) Research Professor, Biological and Agricultural Engineering and Civil Engineering, College of Engineering**, leads the WEF Nexus research group at Texas A&M. A hydrologist by training, Mohtar's professional interests have moved toward understanding the interrelationships of the Nexus and developing quantitative tools to assess sustainable resource allocation tradeoffs and empower dialogue between stakeholders, policymakers and science in an effort to ensure long term resilience and sustainable management of resources.
- **Jack Baldauf, Executive Associate Dean, Associate Dean for Research, Professor, College of Geosciences**, works to understand climate change by translating global processes to local consequences and mitigations. Emphasizing education of educators, students, policymakers and decision-makers, Baldauf's research focuses on Neogene Pacific paleoceanography and understanding variation in production, export productivity and dissolution and the relationship to climate change and the CO₂ cycle.
- **Bruce McCarl, University Distinguished Professor, Agricultural Economics, Texas AgriLife Research**, has focused his research efforts largely on policy analysis (mainly in climate change, climate change mitigation, ENSO analysis and Edwards Aquifer water) and the proper application of quantitative methods to such analyses. He teaches graduate courses in applied mathematical programming and applied risk analysis.
- **Elsa Murano, Director, Norman Borlaug Institute for International Agriculture and Professor, Department of Nutrition and Food Science**, conducts research and teaches food safety. She currently serves as a member of the Board for International Food and Agriculture Development, a presidentially-appointed position that advises the Administrator of the U.S. Agency for International Development within the State Department.
- **Efstratios Pistikopoulos, Associate Director, Texas A&M Energy Institute and TEES Distinguished Professor, Department of Chemical Engineering**, leads the world-class faculty and research team's work and form research collaborations with the best in industry to address the complexity and challenges of important energy problems. Professor Pistikopoulos is an expert in process synthesis, sustainable energy systems and the environment; multi-parametric programming and model predictive control; integration of design, control and scheduling with applications in smart manufacturing.
- **Kent E. Portney, Director, Institute for Science, Technology & Public Policy, Bush School of Government and Public Service**. Portney is the former Director of the Water and Research Program at the Center for International Environment and Resource Policy (CIERP) at Tufts' University. His expertise includes environmental policy, urban sustainability, urban politics, economic inequality, and policy analysis.
- **John Tracy, Director, Texas Water Resources Institute, Professor, Civil Engineering**, has extensive experience relating to water resources management. His recent work has focused on the development and integration of research programs to effectively inform water resources management and policy.
- **Arnold Vedlitz, Professor and Bob Bullock Chair in Government and Public Policy; Director Emeritus and Distinguished Research Scholar in the Institute for Science, Technology, and Public Policy, Bush School of Government and Public Service**. Vedlitz is Division Head for the Science, Technology and Public Policy Division at the Texas Engineering Experiment Station.
- **Kevin Wagner, Deputy Director of Engagement, Texas Water Resource Institute, Professor of Soil & Crop Sciences**. He works with stakeholders in identifying priorities for water resources programs and develops inter-disciplinary teams for addressing these high priority issues. His research focuses on environmental and agricultural response of watersheds to management, particularly effects on water quality and quantity, training water professionals and students on watershed planning, assessment and water policy, and conducting watershed assessment, planning and stakeholder engagement to address water issues.

Partners

- Dwight Look College of Engineering
- College of Agriculture and Life Sciences
- College of Geosciences
- George Bush School of Government and Public Service
- Texas A&M Engineering Experiment Station
- Texas A&M AgriLife Research
- Texas A&M University System

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