



USGS Science in Support of Department of Interior Priorities

Mona Khalil

USGS Ecosystems
Mission Area

June 22, 2021

USGS Mission Areas

Ecosystems

The biological research arm of the U.S. Department of Interior and provides science to help America achieve sustainable management and conservation of biological resources in wild and urban spaces. Scientists examine consequences of climate and environmental change, effects of management actions on communities, lands and species, and risks and solutions to harmful invasive species, wildlife diseases, and contaminants in the environment.

Energy and Mineral Resources

Equips national decision makers in the areas of technology development and energy transitions with essential data on the occurrence and distribution of energy and mineral resources and their wastes; carbon storage capacity; environmental and socioeconomic effects of resource extraction, use, and disposal; global resources; and supply, demand, and trade in nonfuel mineral commodities.

Natural Hazards

Provides scientific information to reduce losses from natural hazards, including earthquakes, landslides, tsunamis, volcanic eruptions, wildfires, and geomagnetic storms. With Federal responsibility for monitoring and notification of earthquakes, volcanic activity, and landslides and coastal erosion in the U.S., delivers actionable assessments of these hazards and helps to develop strategies to make communities more resilient.

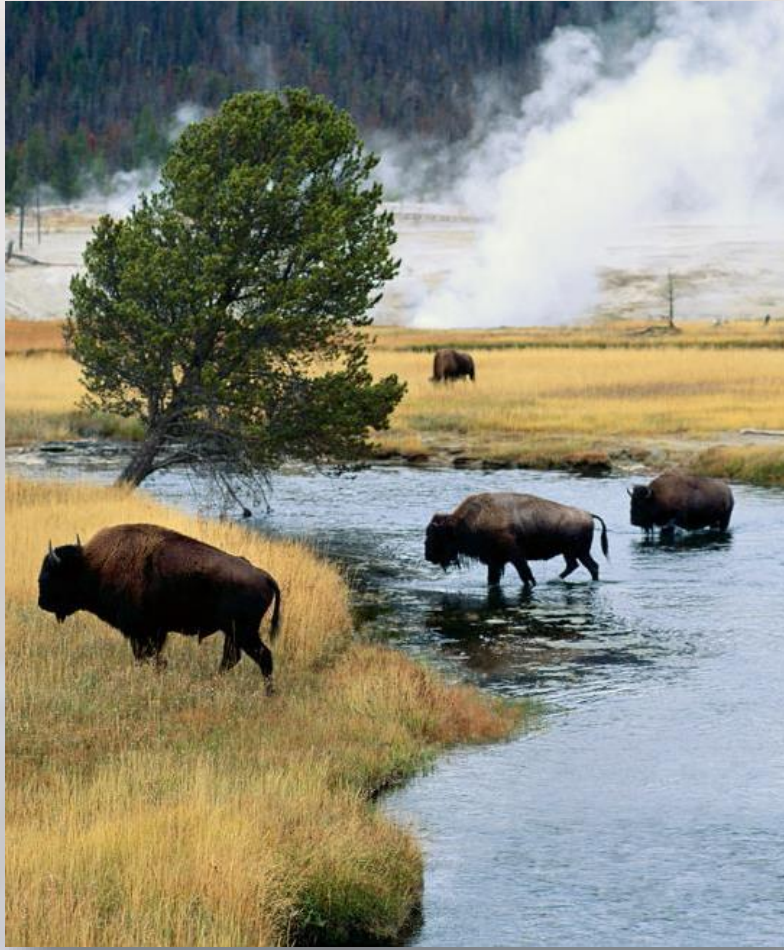
Water Resources

Works with partners to monitor, assess, conduct targeted research, and deliver information on a wide range of water resources and conditions including streamflow, groundwater, water quality, and water use and availability.

Core Science Systems

Conducts detailed surveys and distributes the resulting high-quality and highly-accurate topographic, geologic, hydrographic, and biogeographic maps and remotely-sensed data to the public. Supports land cover change and classification applications; high performance computing and modeling; science data analysis and synthesis; and geoscientific asset preservation. Provides foundational geospatial data for the Nation.

Ecosystems Mission Area Science Vision



The Ecosystems Mission Area is the biological research arm of the U.S. Department of Interior and provides science to help America achieve sustainable management and conservation of biological resources in wild and urban spaces.

Scientists examine consequences of climate and environmental change, effects of management actions on communities, lands and species, and risks and solutions to harmful invasive species, wildlife diseases, and contaminants in the environment.

ECOSYSTEMS



Environmental Health



Contaminant Biology



Toxic Substances Hydrology



Species Management



Fisheries & Aquatic Species



Wildlife



Energy



Land Management



Priority Landscapes



Wildland Fire



Sagebrush Ecosystems



Management & Restoration



Biological Threats



Fish & Wildlife Disease



Invasive Species



Biosecurity



Cooperative Research Units



40 Units in 38 States



Climate Adaptation Science Centers



National CASC & 8 Regional CASCs



Climate Research & Development

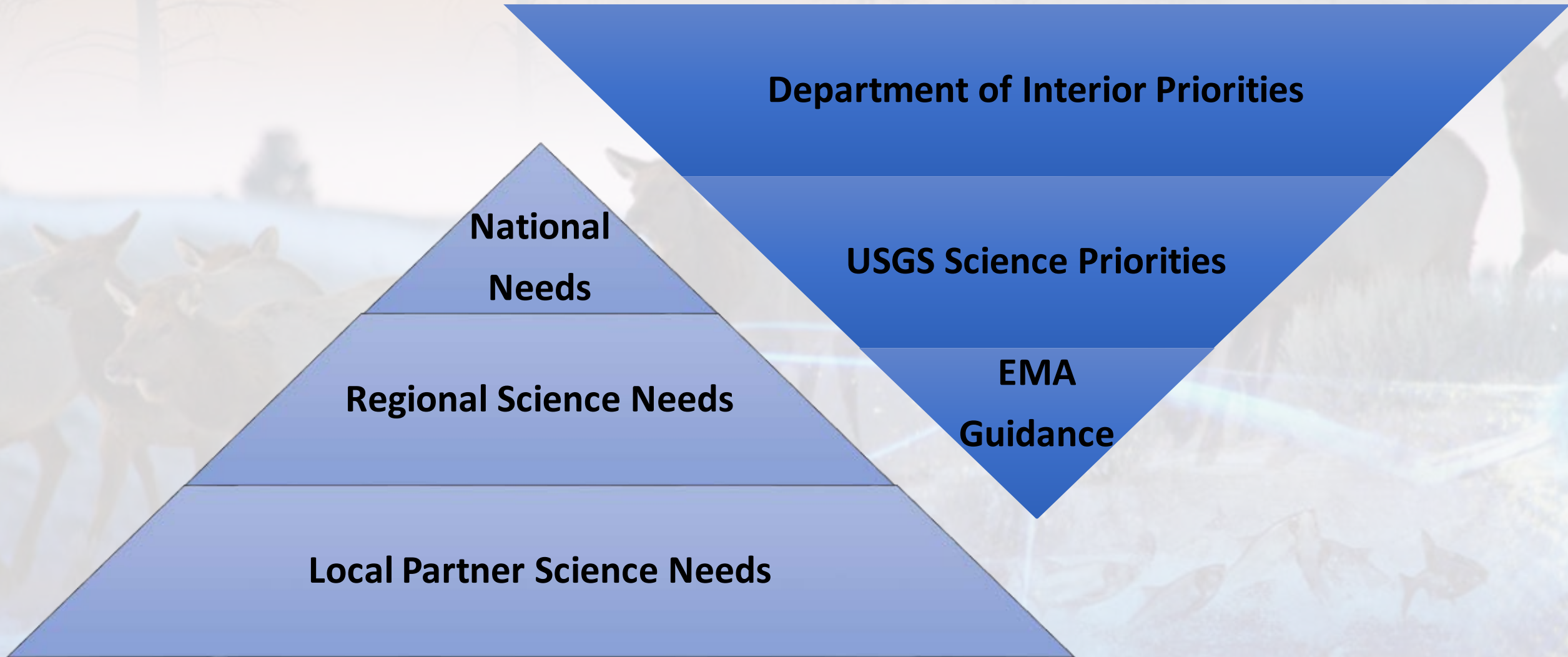


National Climate Assessment 5 Lead



Detail to OSTP

1. Process of Identifying Science Needs



Research Initiatives in Response to Emerging Issues

Long-term and emerging issues drive research agenda

- Migratory bird management and conservation
- Sagebrush ecosystem management
- Wildlife disease: e.g., decline in bat populations, amphibian declines
- Harmful invasive species
- Climate change impacts on species and ecosystems

Research effort is reduced or terminated when management actions are clear/sufficient knowledge has been accumulated

2. Who Conducts the Science?

Collaboration and Co-production

- Subject matter expertise
- On the ground presence, capabilities, and expertise

Competitive Awards

- Cyclical EMA Program Funds
- John Wesley Powell Center for Analysis and Synthesis
- National Innovation Center
- Community for Data Integration
- External funding

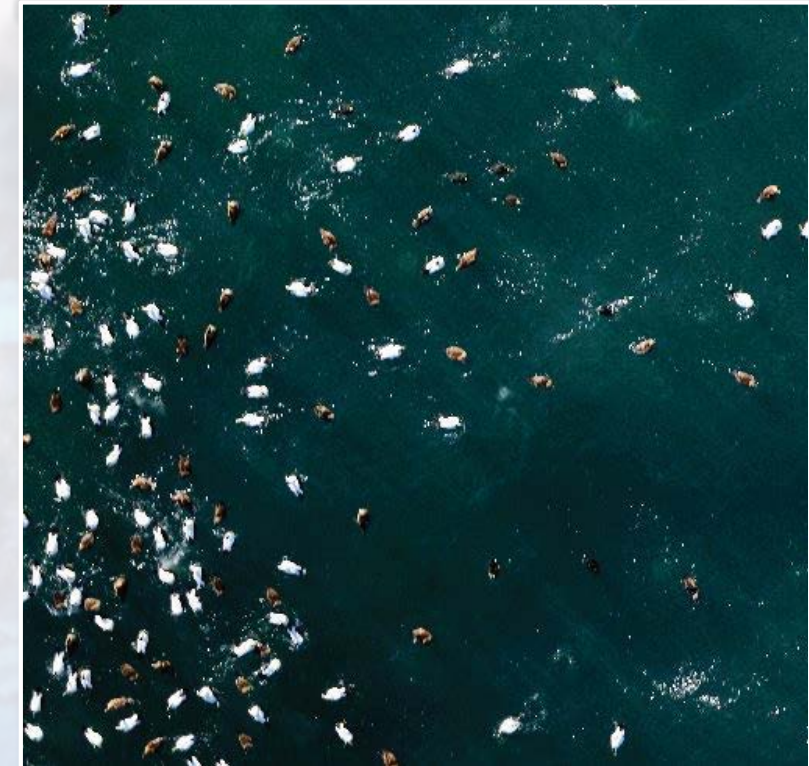
EMA Cyclical Program Funds to Support Partner Science Needs

- Bureau of Ocean Energy Management - Outer Continental Shelf Fund
- Fish and Wildlife Service - Science Support Program
- National Park Service - The Natural Resources Preservation Program
- Invasive Species and Emerging Wildlife Disease
- DOI Monitoring
- Priority Ecosystem Science Program
- Amphibian Research and Monitoring Initiative (ARMI)
- Changing Arctic Ecosystems Initiative

Wildlife Population Surveys to Inform Offshore Wind Energy Planning: Machine Learning for Detection & Classification of Wildlife at Sea



- Collaboration with BOEM, USFWS and UC Berkley Computer Science Vision Group
- Map and monitor wildlife to support energy planning and development offshore
- Deep learning algorithms for automated processing of aerial imagery of wildlife at sea



Response to Emerging Issues: Impacts to bats from wind energy development

- R&D to develop bat deterrents to reduce bat mortality at wind energy facilities
- Collaboration with DOE's National Renewable Energy Laboratory
- Patented technology available for licensing through the USGS Technology Transfer Office

From bat behavior...
to technology
development



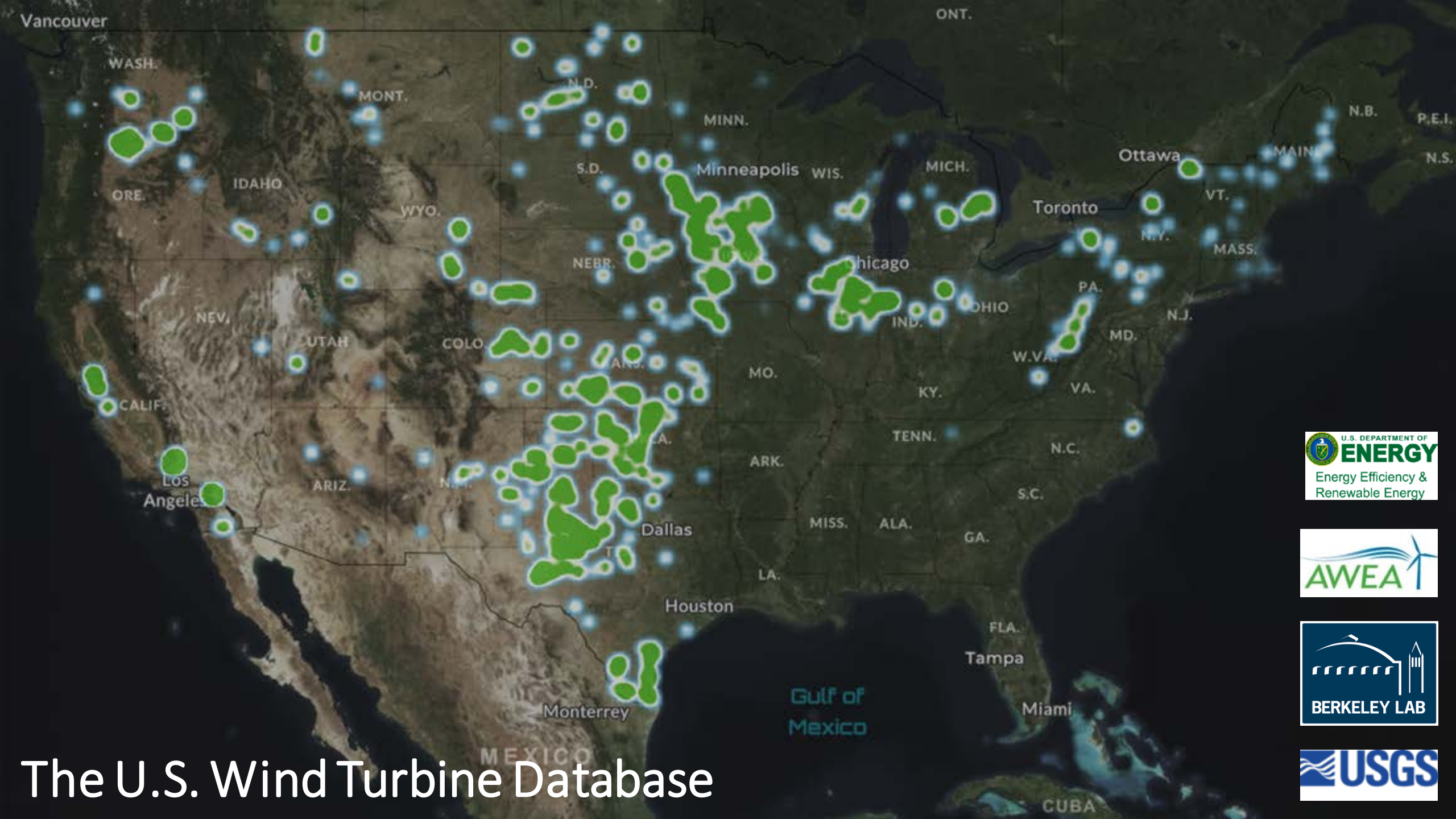
3. Program Outputs

Outputs

- Scientific publications in peer-reviewed journals in compliance with USGS Fundamental Science Practices
- Tools, datasets, patents, protocols and other technical products
- Technical assistance and training

Tracking and Evaluation

- Completion or progress toward planned strategic actions - USGS Annual Performance Plan and Report
- Science Center and Program Reviews
- Quality Management System



The U.S. Wind Turbine Database

4. Program Impacts

Scientific Contributions

- Publications and other technical products
- Research Grade Evaluation (RGE) and Senior Scientist (ST) review

Accomplishments in Basic and Applied Research with Relevance to DOI Partners

- Executive/Secretarial Orders
- New idea generation
- Science intended to support agency decision-making
 - e.g. research in support of Species Status Assessments for FWS

5. Program Improvement

- Integrated Science Strategy
- Program Councils
- Program reviews with external peers
- Partner satisfaction surveys

ECOSYSTEMS

Contact:

Mona Khalil, PhD

**Energy & Wildlife Specialist
Ecosystems Mission Area**

(703) 244-7276

mkhalil@usgs.gov