

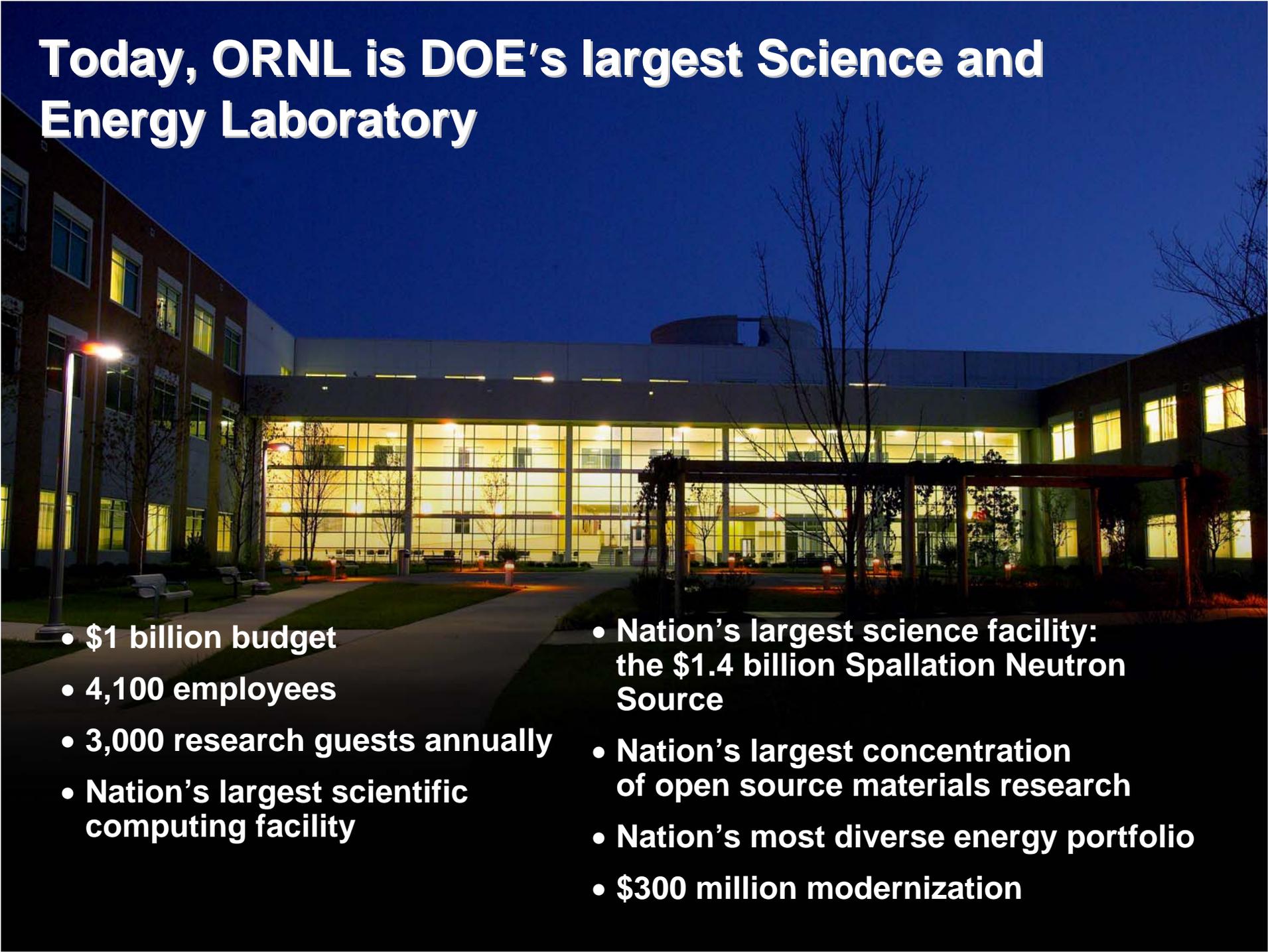
Environmental Sciences Division



Sustainability & Technology Deployment

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Today, ORNL is DOE's largest Science and Energy Laboratory



- \$1 billion budget
- 4,100 employees
- 3,000 research guests annually
- Nation's largest scientific computing facility
- Nation's largest science facility: the \$1.4 billion Spallation Neutron Source
- Nation's largest concentration of open source materials research
- Nation's most diverse energy portfolio
- \$300 million modernization

Environmental Sciences Division...

Science to sustain our environment

Mission

Conduct research, develop technology, and deploy applied technology to understand and assess the response of the environment to global and regional change, environmental stresses, and resource use.

Vision

Solving challenging environmental problems by integrating field and laboratory research with new theory, modeling, and data systems.



Environmental Sciences at ORNL

Earth Sciences



Terrestrial Ecology

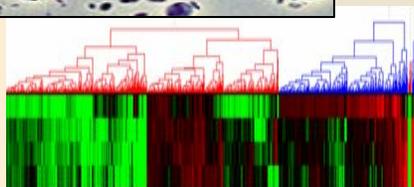
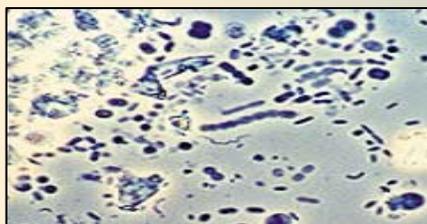


Ecological Management



Detecting and Simulating Environmental Responses

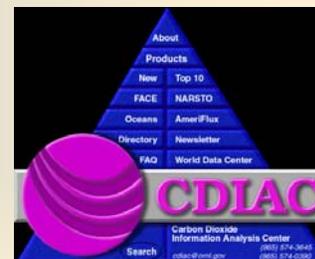
Microbial Systems Biology



Social Behavioral and Economic Sciences



Environmental Data Science and Systems



Earth Sciences

Understand fate and transport processes at multiple scales to allow extrapolation across domains of observation and prediction

- Atmospheric and Aerosol Sciences
- Subsurface Stewardship Science
- Climatic Change, Carbon Cycle, and Carbon Sequestration
- Biogeochemistry of Contaminants
- Behavior of Natural and Artificial Nanomaterials
- Field Research Facilities



Ecological Management

Create and apply effective methods to measure, assess, and manage ecosystems

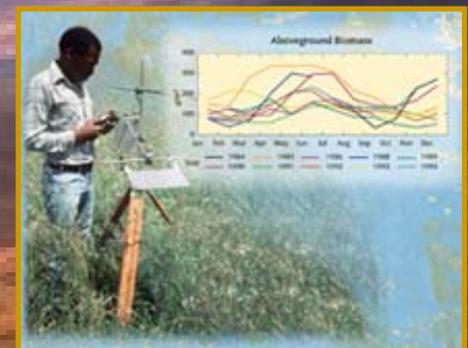
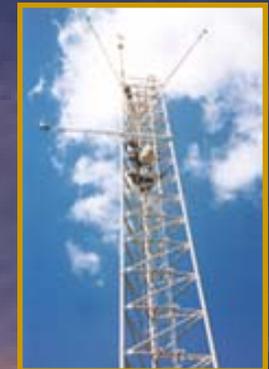
- Aquatic Ecology
- Water Resources
- Sustainable Development
- Environmental Analysis
- Regional Studies



Environmental Data

Provide data management and analysis for large, integrated environmental databases to the nation's research community and policymakers

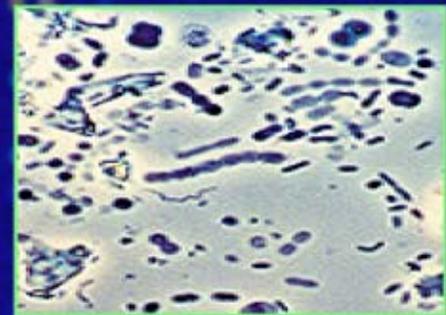
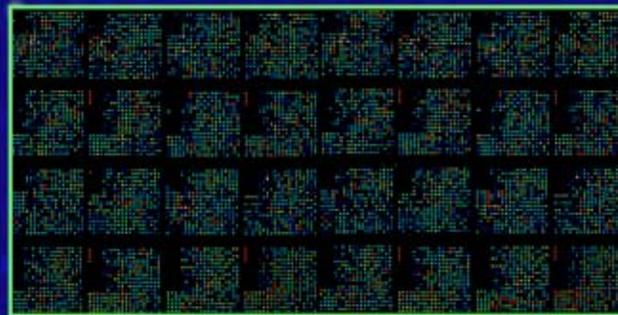
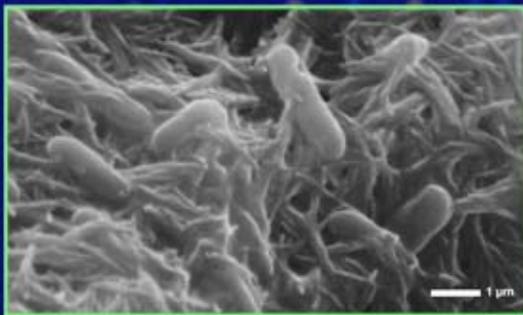
- Carbon Cycle and Carbon Sequestration
- Climatic Change Research
- Atmospheric Radiation Measurements
- Biogeochemistry of Terrestrial Ecosystems
- Biodiversity



Microbial Systems Biology

Harness the capabilities of microbial systems by understanding interactions at genomic, physiological, organism, and community levels

- Microbial Ecology and Physiology
- Genomic Science and Technology
- Climatic Change, Carbon Cycle, and Carbon Sequestration
- Bioremediation
- Bio-based Energy and Products



Social, Behavioral, and Economic Sciences

Develop methods and models; conduct analyses; and produce tools that address key issues at the intersection of science, technology, society, and policy

- Society-Technology Interactions
- Bioenergy Resource and Engineering Systems
- Global Environmental Energy Issues
- Decision Support
- Transportation
- Emergency Management
- Energy System Analysis



Terrestrial Ecology

Understand and predict the dynamic behavior of ecosystems at multiple scales (molecular to watersheds)

- Carbon Cycle and Carbon Sequestration
- Climatic Change Experiments and Simulation
- Landscape Ecology and Regional Studies
- Plant Molecular Ecology
- Bioenergy



Sustainability and Technology Deployment (S&TD) Group

- **Mission – To integrate research and development into field and laboratory methods with new theory, modeling, data systems, policy analysis, and evaluation to create innovative solutions to complex environmental DoD/Others challenges.**
- **Objective – To support research and development through relationships and existing complex environmental restoration, compliance, and sustainability projects. Striving to conduct research, develop technology, deploy innovative technologies, and perform analyses to understand and assess critical environmental systems and infrastructures.**



Timeline: Expanding the Breadth and Depth of Capabilities

S&TD Group, provides innovative, value-added solutions to address DoD compliance, environmental, energy, and technology challenges.

1990

1995

2000

2005 and beyond . . .

*Technology
Deployment*



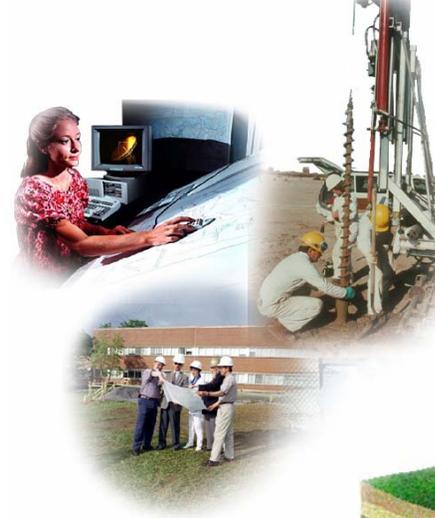
*Environmental
Investigations/
Studies*



Remediation



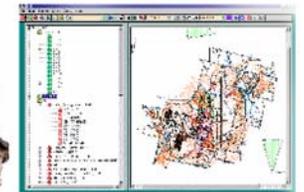
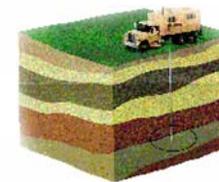
*Life-cycle
Environmental
Management*



*Long-Term
Stewardship*



*Advanced
Program
Management*



*Information/
Data
Management*



Range of Management Experience S&TD Group

- Fixed-price program management
- Site characterization and remediation science pilot studies
- Program/project management
- Waste management/pollution prevention
- Regulatory compliance and permitting requirements analysis
- Hydrogeological analysis
- Environmental training/education
- Risk analysis/assessment
- Hazardous materials management
- Land Use Studies
- Wetland Evaluation/Restoration
- Native Vegetation Studies and Uses
- Technology Integration
- Long Term Monitoring and Natural Attenuation
- Water Sustainability
- Geographic and Information System (GIS) and Remote Sensing

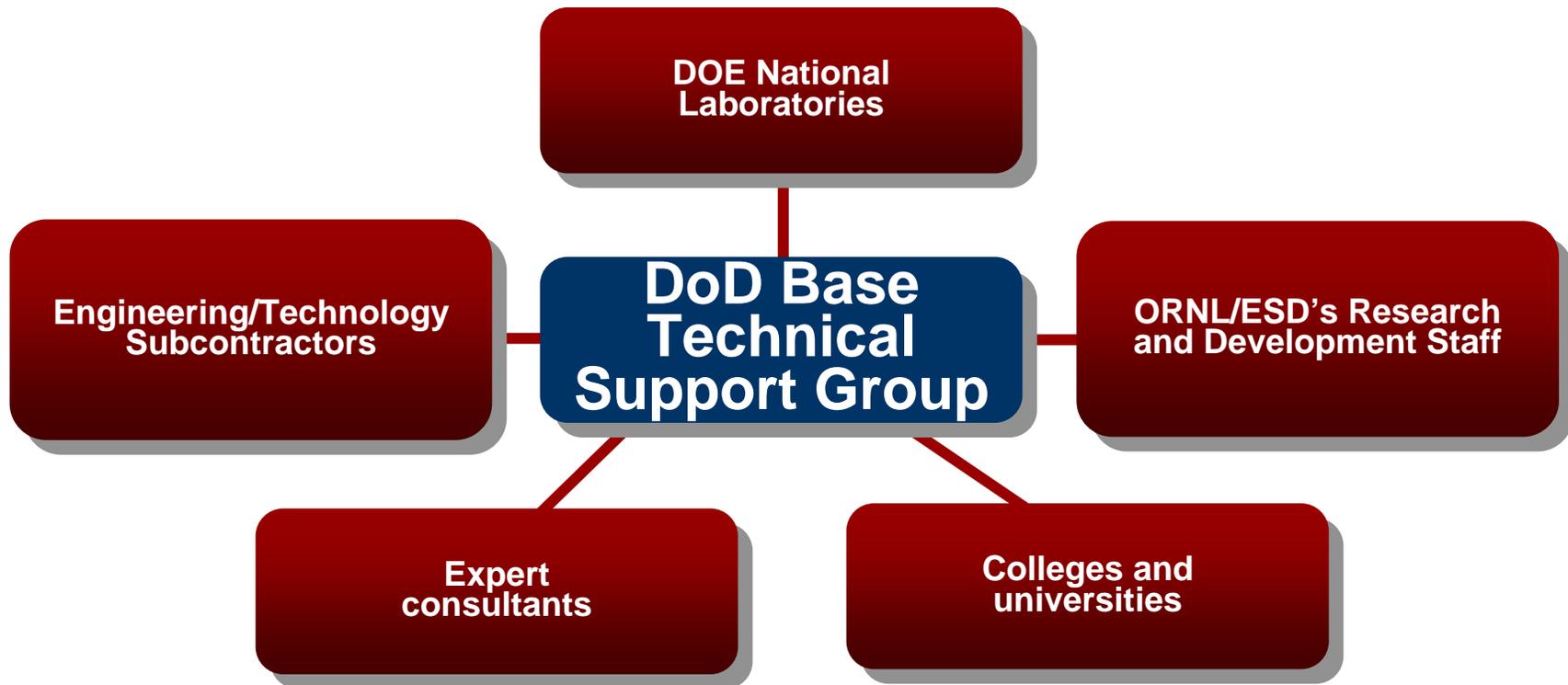


- Information technology
- Flexible funds management
- Business risk assessment
- Environmental Modeling
- Base realignment and Closure (BRAC) Support

ESD offers total project life-cycle management capability.

Resource Integration

The S&TD Group integrates resources from the "BEST OF THE BEST" to ensure that the right resources and expertise are matched to the project.



The S&TD Group Approach

“Honest Broker of Technology”

- **Level of ORNL/ESD involvement based on customer needs**
- **Technology Development and Integration**
- **Flexible funds management**
- **Extensive network of task-ready resources**
- **Rapid placement of tasks**
- **Fixed Price contracting where appropriate**
- **Method of accomplishment selected to provide best value to customer**

Working with DoD to solve environmental and energy challenges

- DoD Sustainability
- Technology Integration
- Energy Advances



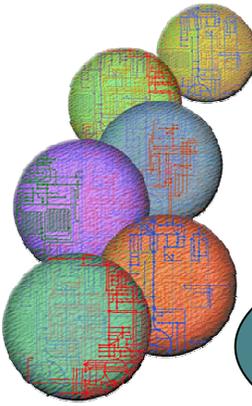
Global Change



Sustainability



Ecosystem Management



Complex Infrastructure

Stewardship

BioEnergy