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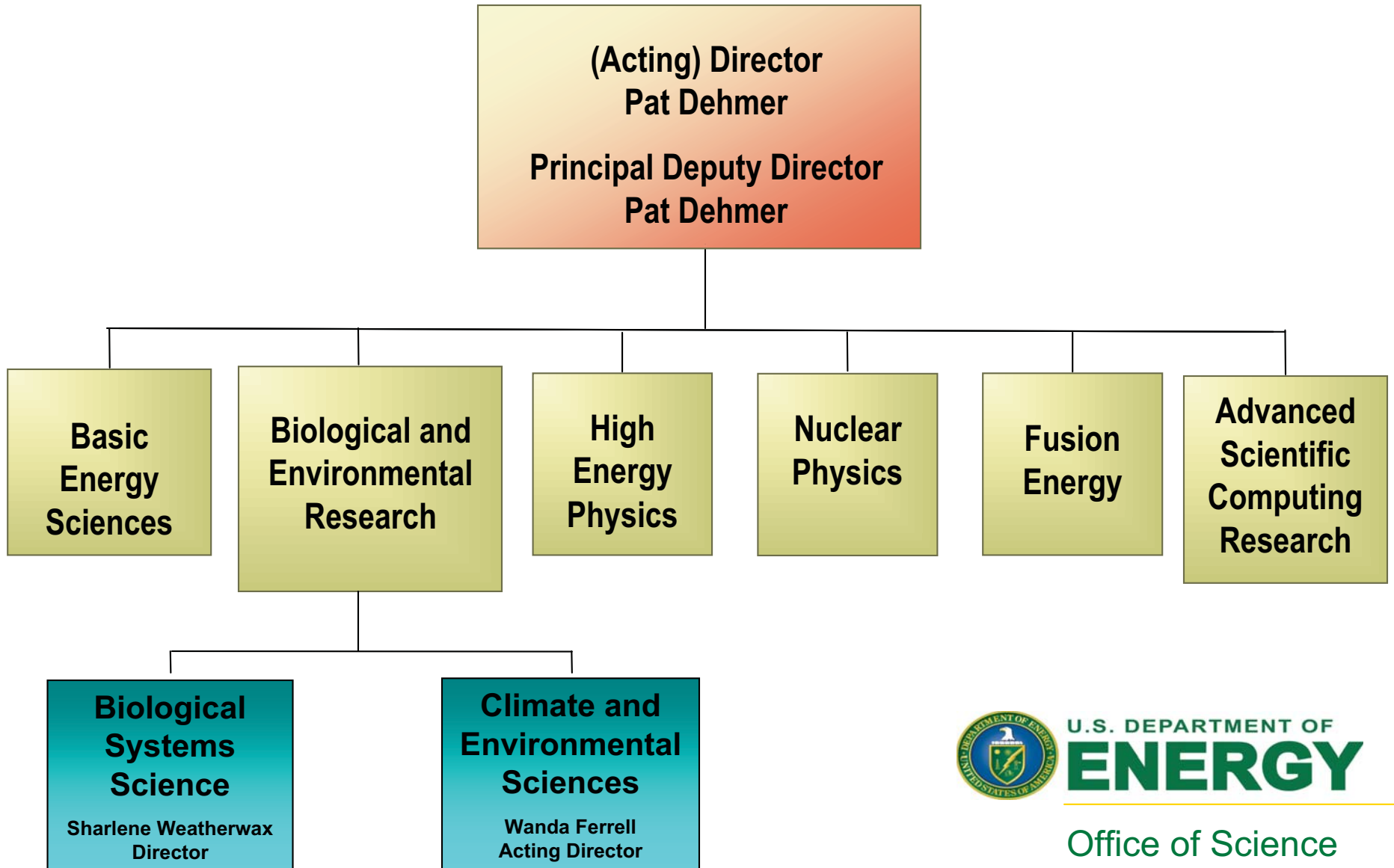
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Biological and Environmental Research

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Mission-Inspired Science

BER advances world-class biological and environmental research and scientific user facilities to support DOE's energy, environment, and basic research missions.

- **Develop biofuels as a major secure sustainable national energy resource;**
- **Understand the potential effects of greenhouse gas emissions on Earth's climate and biosphere, and their implications for our energy future;**
- **Predict the fate and transport of contaminants in the subsurface environment at DOE sites; and**
- **Develop new tools to explore the interface of biological and physical sciences.**



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The BER Approach

- ***Understanding complex biological and environmental systems across many spatial and temporal scales:***
 - from the sub-micron to the global,*
 - from individual molecules to ecosystems,*
 - from nanoseconds to millenia*
- ***Integrating science with tight coupling between theory, observations, experiments, models and simulations***
- ***Supporting interdisciplinary research to address critical National needs.***
- ***Engaging national laboratories, universities, and the private sector to generate the best possible science.***



Office of Biological & Environmental Research

Biological Systems Science Division

- Genomics: GTL
- Bioenergy Research Centers
- Joint Genome Institute
- Low Dose Radiation
- Radiochemistry, Imaging & Instrumentation
- Structural Biology

Climate & Environmental Sciences Division

- Climate Change Research
- ARM Climate Research Facility
- Environmental Remediation Science Program
- Environmental Molecular Sciences Lab



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Energy-Climate Link is the Foundation of the Plan



The strong link between climate change and greenhouse gas emissions resulting from fossil fuel use makes improving the scientific understanding of ongoing climatic change a priority for the U.S. Department of Energy because the Department:

- Is responsible for developing and sustaining a national energy system that is secure and environmentally sound
- Provides critical R&D to deliver future energy systems and infrastructure, which might be affected by the future climate
- Has the unique research capabilities and facilities, as well as the scientific leadership, needed to tackle complex climate change science issues



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BER's "Climate Change Research" Strategic Plan is Online

The Plan — a concise 23 pages — is posted at the BER web site

(<http://www.sc.doe.gov/ober/CCRD/climate%20strategic%20plan.pdf>)

The Plan is based on BER's Climate Change Research mission statement:

Advance the forefront of climate change research to provide the nation with the scientific knowledge it needs about the effects of greenhouse gas emissions on Earth's climate and biosphere to support effective energy and environmental decision making



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Focus Areas



(1) Climate Change Process Research

ARM, atmospheric science, and terrestrial carbon cycle research

(2) Climate Change Modeling

Climate change and integrated assessment modeling

(3) Climate Change Ecological Effects Research

Ecological effects research

(4) Carbon Sequestration Research

Terrestrial ecosystem carbon sequestration research

(5) Education

Undergraduate and graduate education programs

One objective of the plan is to better integrate the elements of the climate program. Better coordination of programs is priority

Follow on activities focus on implementing this integration of elements

Examples

- Development of ARM/ASP science plan
- Recent modeling call for proposals has strong link with process studies
- Stronger links between Terrestrial Carbon Program and Program for Ecological Research



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Better integration requires more consistent approach for selecting and conducting field campaigns and to have all campaigns undergo peer review.

Beginning in 2010 all ASP campaigns will be conducted by the ARM Climate Research Facility

- 2011 campaigns will be selected competitively through the facility process
- Decisions will be made by consensus: Ferrell, Petty, Williamson & Alapaty
- ACRF will conduct the campaign and fund instrument participation
- ACRF will add ASP needs to its instrument procurement list