

Biological and Environmental Sciences

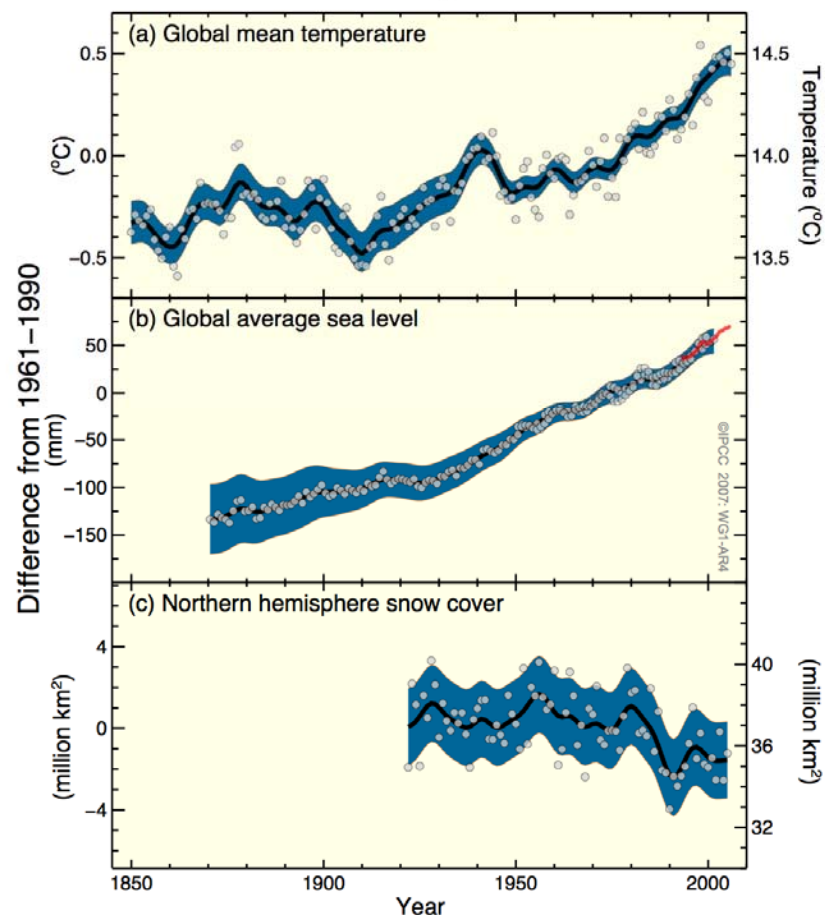
**Mid-FY 2007 Status Update
Reinhold Mann**

**Directorate Staff Meeting
May 2, 2007**



Dominating topics

- Energy, Carbon, Water
- Bioenergy
- Climate Change
- National Security
- American Competitiveness



Source: UN Foundation report, 2/07



Agenda items

- **Safety**
- **West End Campus development**
- **Financial update**
- **HR update**
- **ORNL priorities**
- **Planning for FY 2008 and beyond**
- **WFO update**
- **BER's new approach to funding the labs**

Injury/Illness/First Aid Cases

Director: Mann

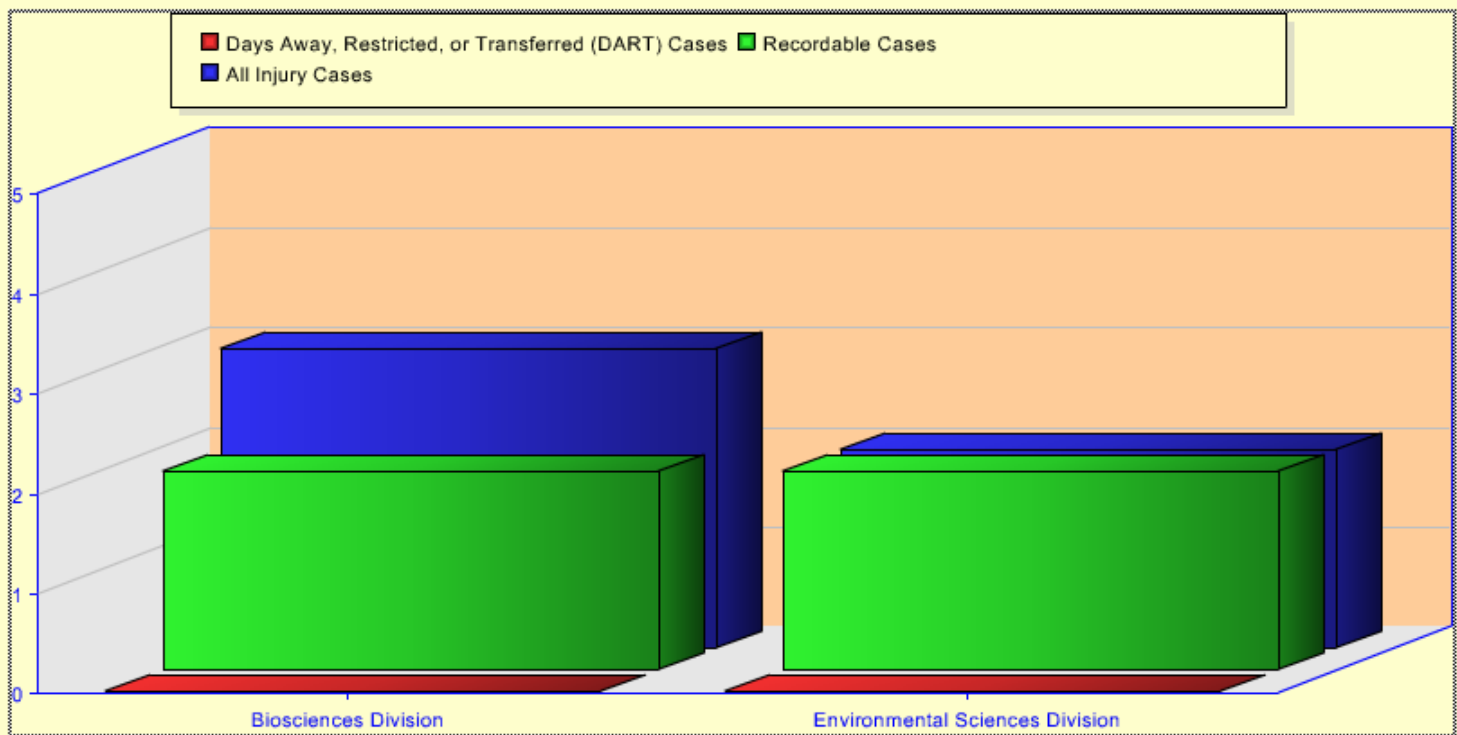
Fiscal Year 2007

[\(Switch to Calendar Year\)](#)

[\(FY-2004\)](#)

[\(FY-2005\)](#)

[\(FY-2006\)](#)



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FIRST AID

March 06, 2007. Lab Tech (LifeScsDiv) sustains chemical burn when he brushed against spilled Phenol.

ILLNESS, RECORDABLE

December 15, 2006. Over the course of the last 5 years Research Associate?s (BioScsDiv) hands and fingers have progressively become painful with computer use.

INJURY, RECORDABLE

March 05, 2007. Student (ORISE-Bio&EnvScsDir) received tick bite.

February 12, 2007. Information assistant has allergic reaction to painting activity in workplace.

November 02, 2006. Employee (BioDiv) was injured when using a razor blade to open a box.

Injury/Illness/First Aid Cases All Directorates Fiscal Year 2007

[\(Switch to Calendar Year\)](#)

[\(FY-2004\)](#)

[\(FY-2005\)](#)

[\(FY-2006\)](#)

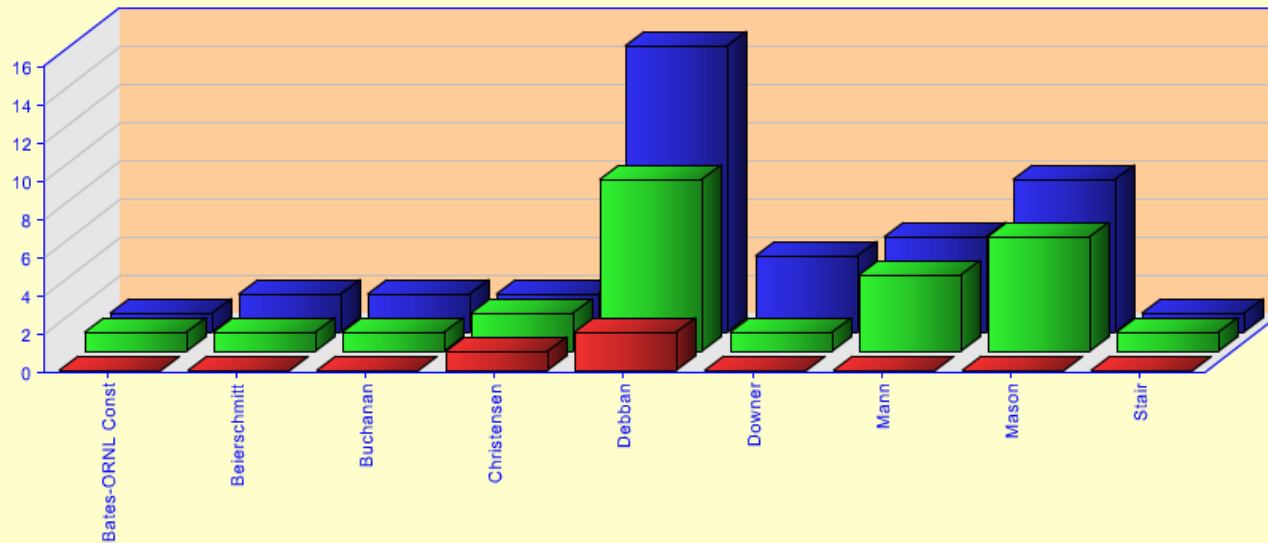
YTD Summary

Does NOT include Visitors

RII (Goal: 26)*	DART (Goal: 10)*
26	3

*Maximum number to meet SC Goal

■ Days Away, Restricted, or Transferred (DART) Cases
 ■ Recordable Cases
■ All Injury Cases



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Renovation Schedule

FY2007

- **Renovate 1504**
- **Renovate 1st floor of 1505 west end for field work activities**
- **Renovate 1st floor 1505 auditorium**
- **Remove library and add 8 offices**
- **Renovate offices on 2nd/3rd floor of 1505**
- **Refurbish 1507**
- **Refurbish 1509**
- **Relocate BSD GTL effort into 1060**



Renovation Schedule

FY2008

- Relocate Bioconversion Science to 2nd floor of 1505
- Relocate Biological and Nanoscale System to 2nd floor of JIBS
- Vacate 1503 to move to 1st floor of 1505
- Finish office renovations in 1505
- Renovate 1061
- Relocate Directorate to 1st floor of 1505

West Campus Modification

An aerial photograph of a university campus, showing several large, multi-story buildings with flat roofs. There are extensive parking lots with many cars, and green spaces with trees and walkways. The campus is surrounded by a dense forest of trees. The image is slightly faded, serving as a background for the text.

FY 2007

- **Construct JIBS**
- **Relocate power lines**
- **Upgrade telecommunications**

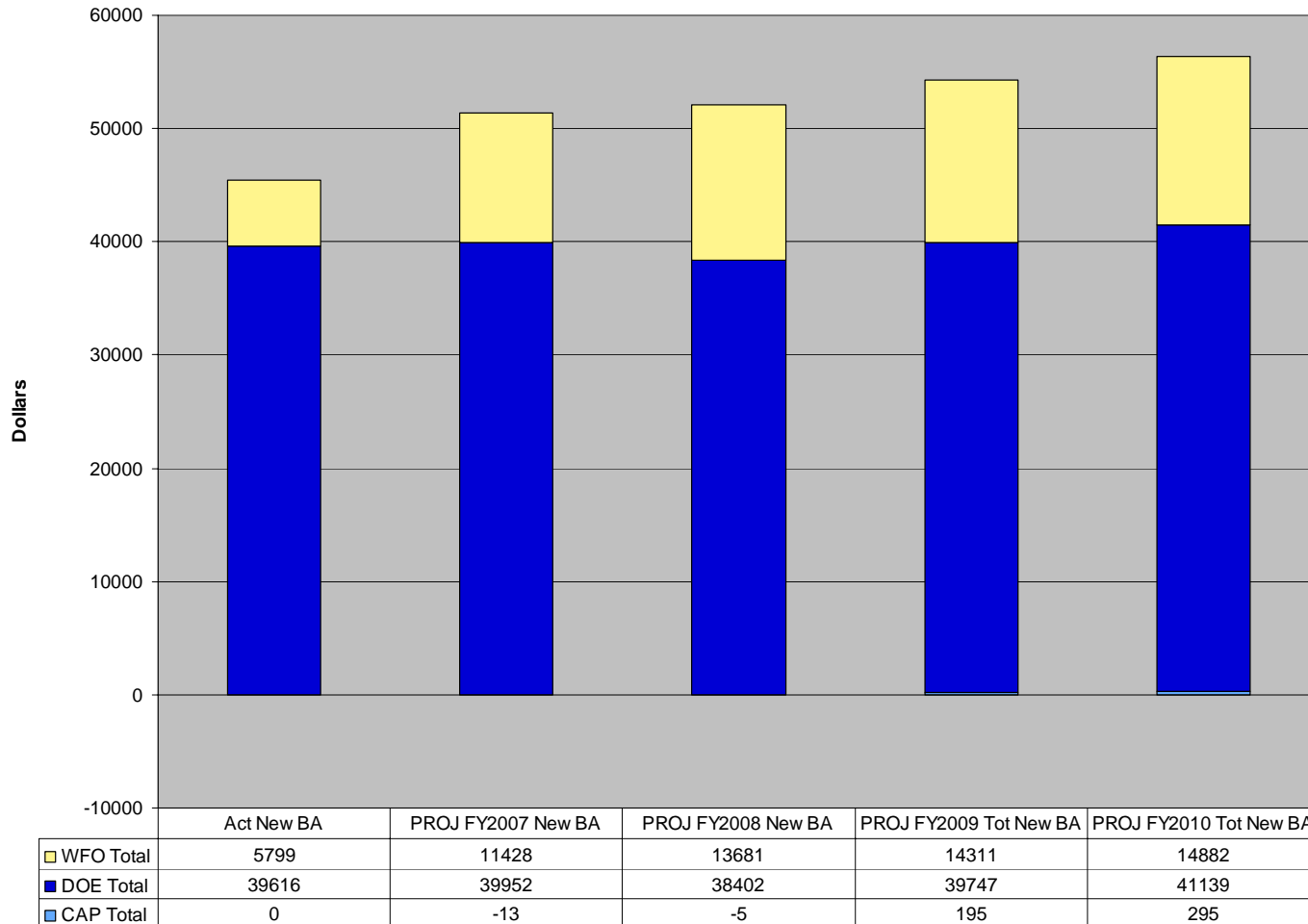
FY 2008

- **Construct Environmental Sciences Support Facility**
- **Reconfigure First Street**
- **Close ponds**

FY 2009

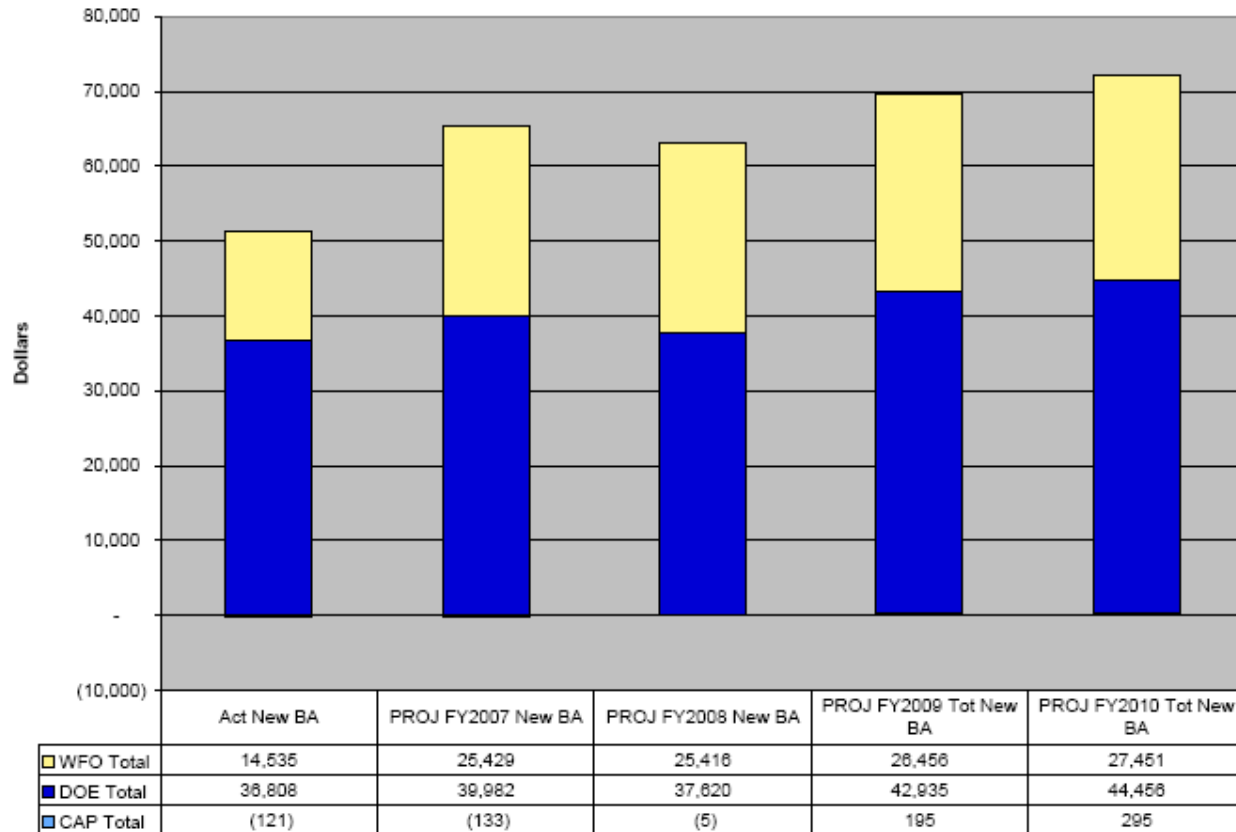
- **Construction of West Campus Quad and major re-landscaping**

FY 2007 – 2010 Conservative BA projections



Funds coming through B&ESD office, not total B&ESD funding

FY 2007 – 2010 Conservative BA projections – all funds in B&ESD



HR update (FYTD)

- **346 applicants – 11 hires**
- **8 active searches**
- **10 staff terminated employment, including 3 planned retirements**
- **B&ESD will meet FTE goal**
- **2007 Gallup survey**
- **New Senior HRM will be hired soon**



Our proposal to establish a DOE Bioenergy Research Center is under consideration

- Submitted 1/29/07 for \$125M over 5 years
- Reviewed April 25-27
- Selected for reverse site visit on May 30
- Decision planned to be announced in June 2007

- bioenergycenter.org



BioEnergy Science Center

BioEnergy Science Center (BESC)

Oak Ridge National Laboratory
Principal Investigator: Martin Keller • E-mail: kellerm@ornl.gov
Funding Opportunity Number: DE-PS02-06ER64304 • ORNL FWP#ERKP695

February 1, 2007

with
Georgia Institute of Technology
National Renewable Energy Laboratory
University of Georgia
University of Tennessee

in partnership with
ArborGen LLC
Dartmouth College
Diversa Corporation
Mascoma Corporation
The Samuel Roberts Noble Foundation, Inc.

with individual contributions from
Brookhaven National Laboratory
Cornell University
University of California-Riverside
University of Minnesota
Virginia Polytechnic Institute and State University
Washington State University

U.S. Department of Energy
Office of Biological and Environmental Research
GTL Bioenergy Research Centers

Biomass Deconstruction & Conversion

Computational Biology

Switchgrass

Populus

Biomass Characterization

Biofuel Powered E-85: Cleaner & Abundant

Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6026, U.S.A.



BioEnergy Science Center team

Oak Ridge National Laboratory
University of Georgia
University of Tennessee
National Renewable Energy Laboratory
Dartmouth
Georgia Tech
Samuel Roberts Noble Foundation
ArborGen
Diversa
Mascoma
with individuals from
U California-Riverside, Virginia Tech
Cornell, WSU, U Minnesota, NCSU, BNL

**Joint Institute for Biological Sciences
U Tennessee-ORNL**



**Complex Carbohydrate Research Center
University of Georgia**



**Alternative Fuels User Facility
NREL**



Bioenergy Science Center (BESC)

Mission

Create revolutionary advancements in overcoming the recalcitrance of biomass for sustainable large-scale biofuel production through fundamental plant and microbial systems biology and by exploiting the natural diversity of biological systems and enzymes

Vision

- **An internationally recognized center leading interdisciplinary research focused on scientific advancements underpinning commercially scalable and environmentally sustainable bioenergy production**
- **An openly accessible resource for data, information, and methods leading to bioenergy solutions**
- **Fully integrated with other bioenergy-related data sources and research activities**

The BESC leverages substantial commitments and investments

- **State of Tennessee, through UT: \$24.6M**
 - JIBS construction: \$11.6M
 - Research equipment: \$3M
 - Joint UT-ORNL research: \$10M
 - 3 Governor's Chairs: \$3M–5M
- **State of Tennessee: \$48M**
 - \$40M for 5M-gal/year pilot switchgrass-to-ethanol facility, located <40 miles from ORNL, to be operational in 2009
 - \$8M in agricultural price supports
- **Mascoma: \$5M to support projects that complement BESC at partner institutions**
- **Georgia Research Alliance: \$3M for equipment, \$1.5M in support for two Eminent Scholar hires (matched by \$1.5M from UGa and GaTech): \$6M total**
- **Virginia Tech: \$0.5M in cost share support**
- **Linkages to:**
 - Chevron's investment of \$12M in renewable technologies at GaTech and \$2M at NREL
 - **New \$40M Oklahoma Bioenergy Center (Noble Foundation, University of Oklahoma, and Oklahoma State)**

**Total:
More than \$120M**

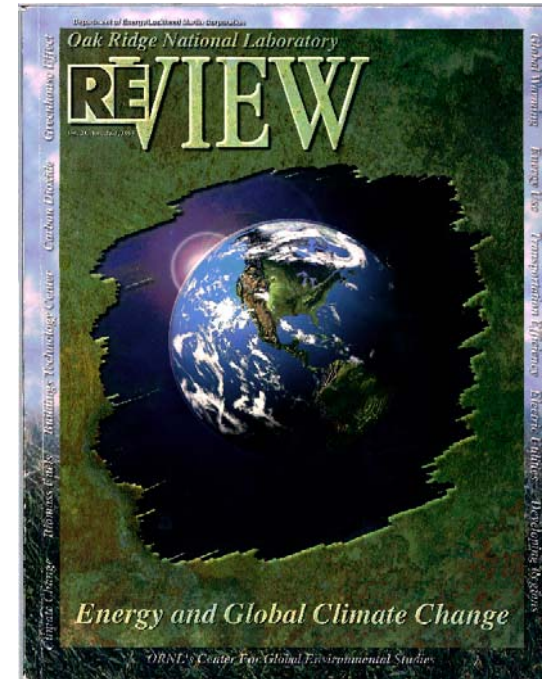
Climate Change Research at ORNL

- **Global Climate Modeling**
 - Advanced computing support to CCSM
- **Stewardship of climatic data**
 - ARM archive, CDIAC, NASA DAAC, NBII
- **Design and execute unique experiments for observation and manipulation of ecosystems to understand how they respond to climatic change variables**
 - FACE, TDE, TARP, OCCAM, HERMES, WBW
- **Global Carbon Cycle and Carbon Sequestration**
 - ITCM, SOCCR, CSiTE
- **Translating science into practical use**
 - Climate impact assessments (water, forests, energy, and human settlements), adaptation to climate change, human dimensions
- **Using the Oak Ridge Reservation – a unique resource**
 - Watershed biogeochemistry and stream ecology
 - Ecological genomics
 - Invasive species
 - Ecosystem restoration



Unique ORNL Strengths

- **Oak Ridge Reservation**
 - Facilities for testing ecosystem response
- **Microbial and Plant ecology science**
 - Only DOE Lab with strength in both
- **Computational science**
 - Hardware and software
 - Data and information integration, analysis, and management
- **Impact, adaptation, economics, policy and integration science**
- **Sensors and sensor networks**
- **Energy R&D**
 - Basic (SNS, CNMS, BES, BER -GTL, etc)
 - Applied (EERE buildings, transportation, lighting, etc)



ORNL Review, 1995

ORNL Review, Fall 2007,
focusing on Climate
Change Research

The questions and challenges are clear,
how the US/World address them is not

- **Impacts are regional, solutions are global**
- **Models must address a complex suite of factors at multiple, relevant scales**
 - Energy, carbon cycles, water
 - Technology, economics, policy
- **New observations, experiments, and modeling frameworks that inform the models of human and environmental systems at relevant scales**

How do we change the ORNL game to the >\$100M level?

- **Climate change R&D must be Lab leadership priority**
 - Major partners in this include UCB/LBNL, PNNL, LLNL (LANL, BNL, ANL minor partners)
- **Strategic hires**
- **Investment in critical projects and infrastructure**
- **Initiate working teams with researchers across ORNL**
- **Creation of a new research institute**

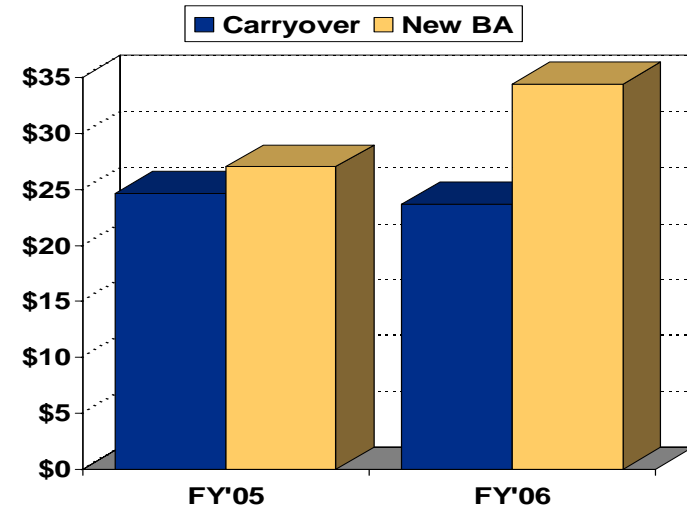
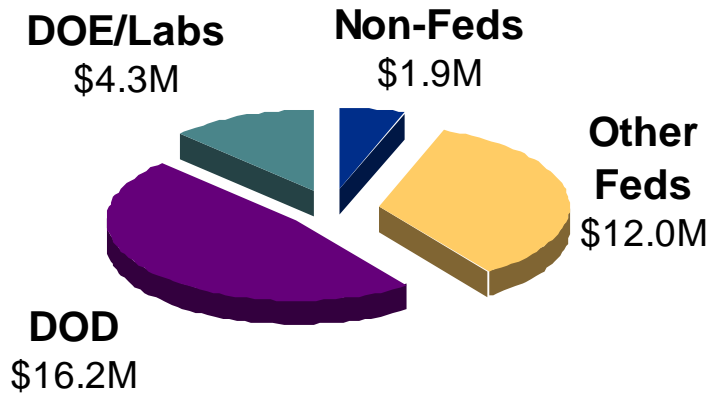
Why we need to start now...

- **Now is the time to stake out position for ORNL as a significant player**
 - Set as priority on the Lab agenda
 - Invest in “unfair” advantage
 - Engage scientific community
 - S&T and policy components
- **We have many assets in place to be leveraged**
- **Experiments require ~ 20 years**
 - Baseline observations and set-up (5 yrs), experiments (10 yrs), shut down and final observations (5 yrs)
 - Integration with model improvements and use of models to guide experiments
 - Engineering challenges for warming, CO₂, precipitation controls at larger scales

Planning for FY 2008 and beyond

- **LDRD process underway**
- **B&ESD off site meeting June 12**
- **Mouse genetics program site visit this summer**
- **Lab-wide bioenergy off-site meeting June 20 – to be announced shortly**

WFO: a large part of our funding



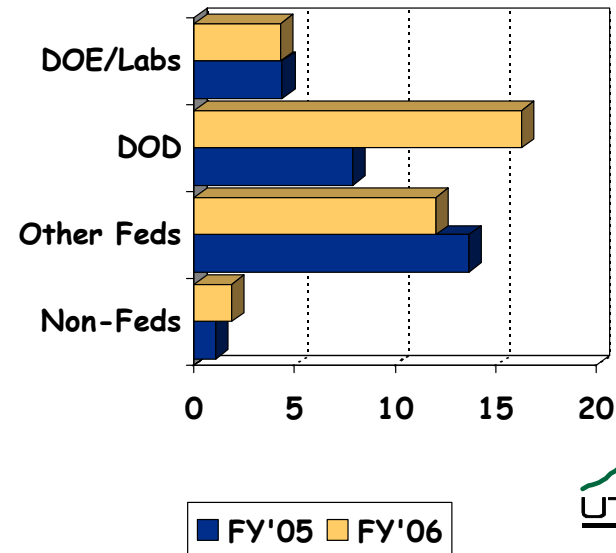
\$34.4M new BA in FY06

DOD: Dover AFB, Ft. Stewart, SERDP

Other Feds: NASA, FEMA, EPA

DOE/Labs: BMAP plus misc. funds-in

Non-Feds: ~30 small sponsors



High Diversity among WFO sponsors (beginning FY07 budgets)

Non-Fed sponsors:

Ellison Med. Foundation	\$265K
Sense Holdings, Inc.	\$182K
Yahsgs, LLC	\$149K
Rensselaer Polytech. Inst.	\$118K
U. Tennessee	\$106K
Sixteen others	\$565K

DOD sponsors:

Dover AFB	\$7.1M
Ft. Stewart/Hunter AA	\$3.8M
SERDP	\$3.0M
Army Environ. Center	\$692K
Army National Guard	\$437K
Six others	\$500K

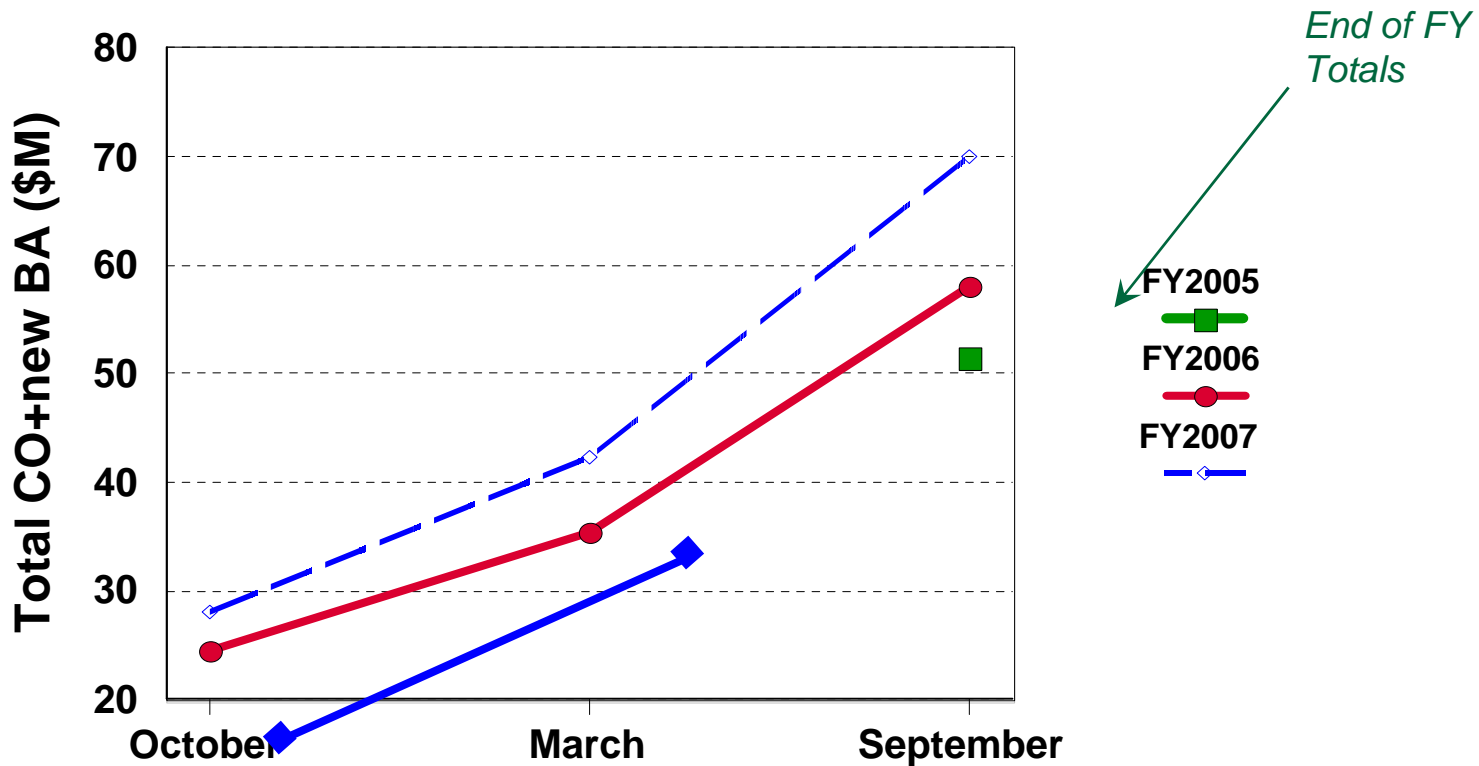
Other Fed sponsors:

NASA	\$4.9M
EPA	\$4.1M
FEMA	\$1.3M
NRC	\$849K
CBRN Countermeasures	\$471K
FERC	\$391K

DOE/Labs sponsors:

BWXT Y12	\$938K
ANL	\$819K
Bechtel Jacobs	\$796K
LBNL	\$404K
Germantown	\$325K
Seven others	

FY07 looks like another good year for WFO (up to \$70M?)

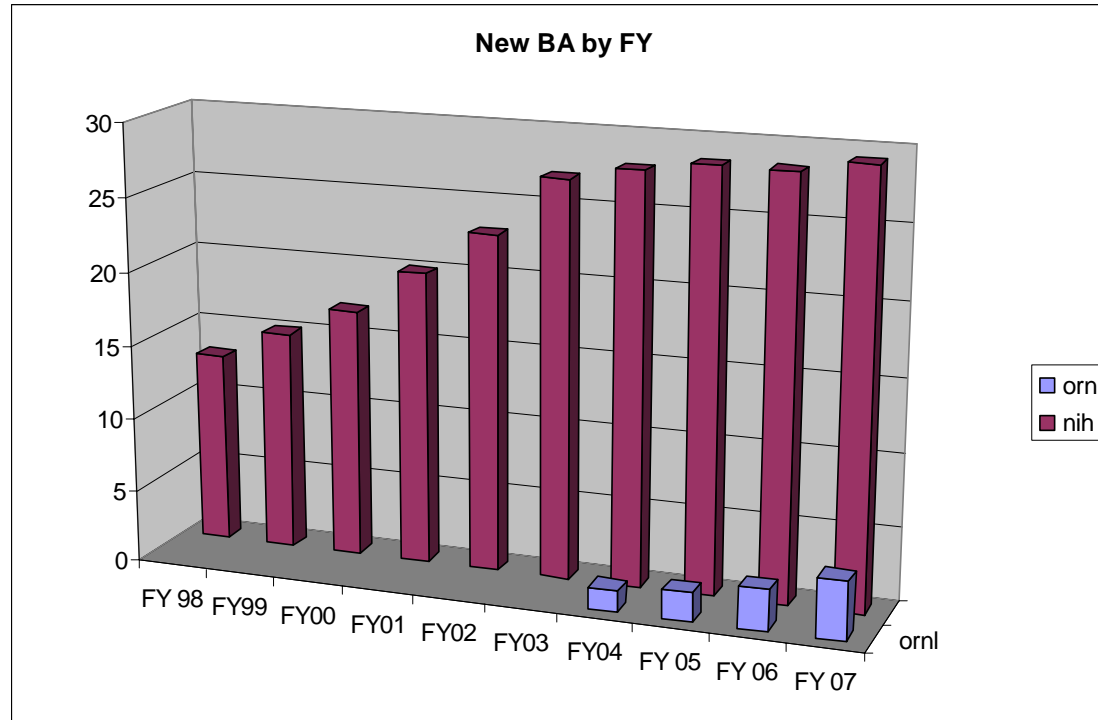


Carryover (CO) from previous year

EoY projected in proportion to FY06 experience.

NIH update

- **Lab-wide: 25 submissions, 9 awards, \$3.3M new BA FY2007**
- **B&ESD: 11 submissions, 6 awards, \$1.58M new BA FY2007**



NIH - \$B
ORNL - \$M

New BER approach

- **Support appropriately sized efforts within Science Focus Areas (SFAs) that leverage the strengths of the national labs**
- **Three design principles**
 - Rigorous peer-review
 - Team-based efforts
 - Portfolio of Scientific Focus Areas (SFAs)

Scientific Focus Areas cross existing B&R codes

- **Life Sciences**
 - **Genomics: GTL Biofuels**
 - **Genomics: GTL Bioenergy Research Centers**
 - **Genomics: GTL GTL Fundamental Science**
 - **Ethical, Legal and Societal Issues**
 - **Low Dose Radiation**
- **Climate Change Research**
 - **Forcing**
 - **Modeling**
 - **Response**
 - **Mitigation**
- **Remediation Science**
 - **Integrated Environmental Remediation Field Studies**
 - **Subsurface Science**
- **Medical Applications**
 - **Medical Imaging Sciences**
 - **Advanced Medical Instrumentation**
- **Other**
 - **Scientific User Facilities**
 - **Human Subjects**

Action Items

- **Identify SFA Laboratory Research Managers**
- **Prepare program plans (5-10 year vision) for each SFA**
 - Summary due to BER in July 2007
 - Full, peer-reviewable version during FY08
- **Prepare for regular SFA reviews (on site or reverse-site)**
- **We are starting the formal dialog with BER next week – mostly to obtain answers to questions related to**
 - Expected level of portfolio integration/coordination
 - Mapping of existing FWPs onto new SFAs
 - Funding levels
 - Level of details expected for the July 2007 version of our plan

Questions, suggestions, comments?