

ORNL DAAC for Biogeochemical Dynamics



<http://www.daac.ornl.gov>

*A briefing for
Sue Ringrose, Dozie Ezigbalike (University of Botswana),
Leon Herbert (University of Witswatersrand), and
Lance Coetzee (Environmental Management Services)
June 19, 2000*

L. D. Voorhees, DAAC Manager, ORNL*
865-574-7309; ldv@ornl.gov

* Oak Ridge National Laboratory, managed by UT-Battelle, LLC,
for the U.S. Dept. of Energy under contract DE-AC05-00OR22725.

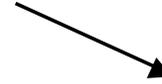
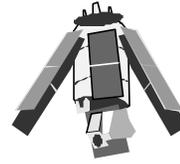
Outline

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- ❑ Host Institution
 - ❑ NASA's Earth Observing System Program
 - ❑ ORNL's Mission and Role in EOSDIS
 - ❑ Use of the Data
 - ❑ Data Holdings and Accessing Data
 - ❑ User Statistics
 - ❑ Steps of Data Processing and Support
 - ❑ DAAC Resources

Host Institution

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- ❑ Oak Ridge National Laboratory (ORNL), a U.S. Department of Energy R&D facility
 - ❑ ~ 4,500 employees, 17 research divisions
 - ❑ Environmental Sciences Division (ESD)
~ 300 staff, postdocs, students, and subcontractors
 - ❑ DAAC has staff from ESD, computer science divisions at ORNL, and subcontractors
 - ❑ Three international environmental data centers in ESD (i.e., DAAC, CDIAC, ARM Archive)

EOS



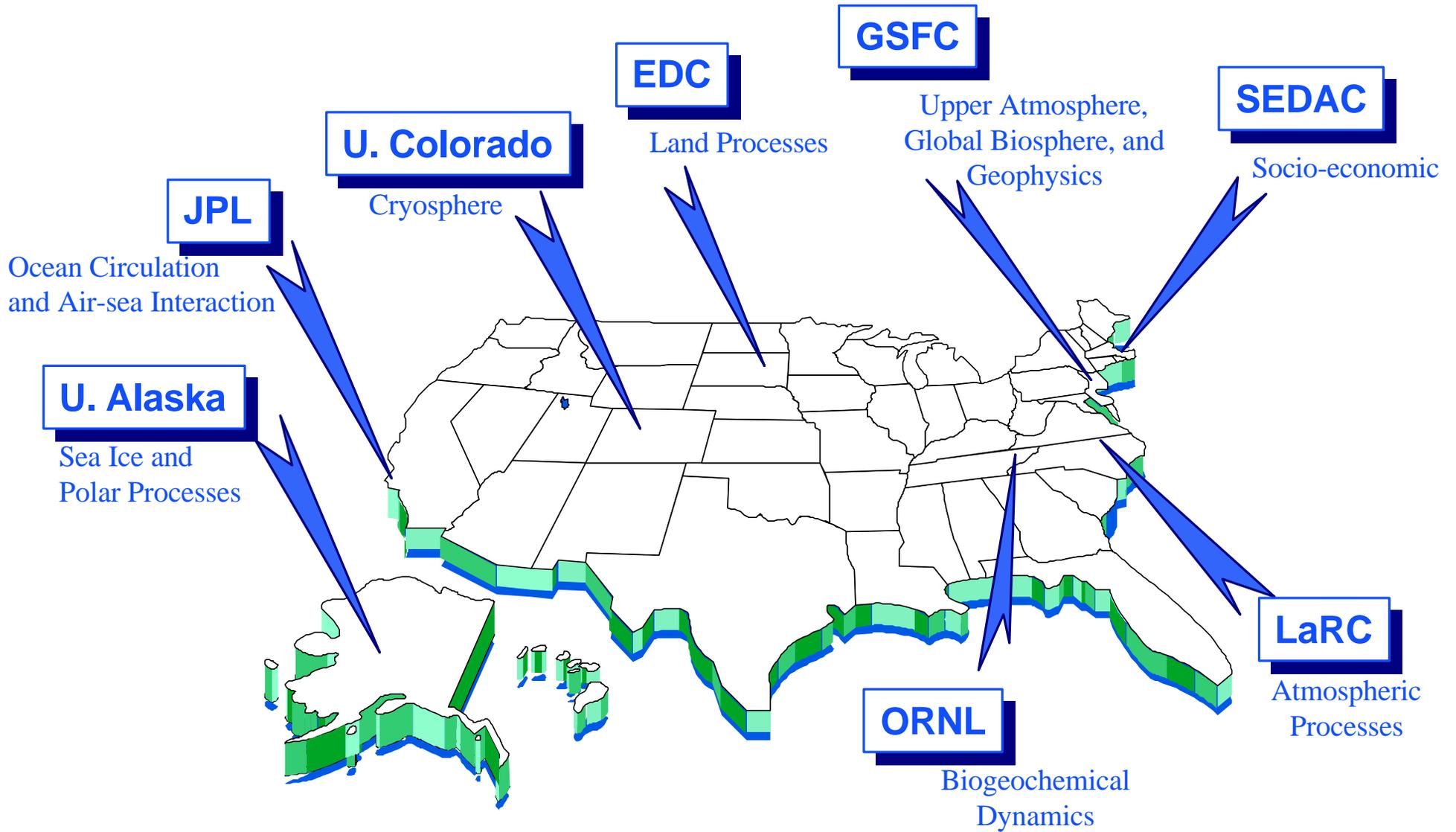
□ NASA's Earth Observing System (EOS) Program

- centerpiece of NASA's Earth Science Enterprise, largest component in the U.S. Global Change Research Program
- spaced-based observing system
- ground-based field campaigns
- objective is to enable quick and easy access to data about the earth

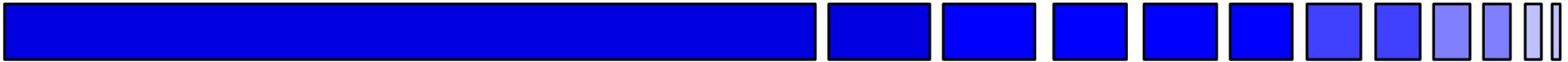
□ EOS Data and Information System (EOSDIS)

- data distributed via 8 Distributed Active Archive Centers (DAACs), organized by scientific discipline
- ORNL focuses on biogeochemical dynamics and ecological data

EOSDIS Distributed Active Archive Centers



ORNL DAAC Mission and Goal



❑ Mission

- to acquire, document, quality-assure, archive, and distribute data for terrestrial biogeochemistry and the ecosystem dynamics of global environmental change

❑ Goal

- to be recognized as a major source of ecological data for global change research

ORNL DAAC Role in EOSDIS



- ❑ Archive and distribute biogeochemical and ecosystem dynamics data
 - NASA's field campaigns
 - EOS land validation data
 - Regional and global ecosystem data
- ❑ Support NASA field campaigns
- ❑ Support EOS land validation field activities

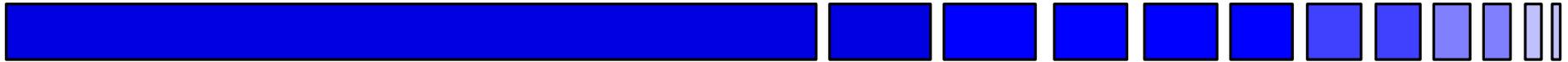
Unique Characteristics of the ORNL DAAC



- ❑ Holds numerous and highly diverse data, resulting in many relatively small data files
- ❑ Supports NASA field projects of relatively short duration, having many PIs (~30-100)
 - data come to the DAAC from projects' data management systems
- ❑ Archives non-NASA data supporting global change research
- ❑ Does not receive unprocessed data from an instrument like other DAACs

ORNL DAAC Data

Used for a Number of Purposes



- ❑ Document long-term trends
- ❑ Understand biogeochemical processes
- ❑ Develop and validate process-based biogeochemical models
- ❑ Verify classifications based on remotely sensed information
- ❑ Integrate process understanding with remote sensing observations
- ❑ Validate remote sensing products and ecosystem models

Data Holdings (500+ data sets)



❑ Field Campaigns

- BOREAS (280+ data sets)
- FIFE (115 data sets)
- OTTER (15 data sets)
- LBA (1 data set)
- SNF (37 data sets)

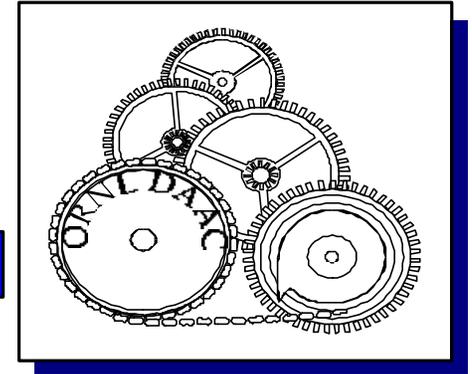
❑ Land Validation

- Accelerated Canopy Chemistry Program (5 data sets)
- 62 data sets registered in Mercury

❑ Regional and Global Ecosystem Data

- global climate data (4 data sets)
- global soil data (2 data sets)
- global vegetation data (1 data set)
- hydroclimatology data (5 data sets)
- NPP (42 data sets)
- RivDIS (1 data set)
- VEMAP-1 (6 data sets)
- 33 data sets registered in Mercury

Accessing ORNL DAAC Data



- ❑ ‘Local’ Web-based interface (<http://www.daac.ornl.gov>): search by parameters, sensors, sources, investigators, keywords, geographic locations, time
- ❑ Anonymous ftp, also supported with Web front-end
- ❑ EOSDIS Data Gateway: Web-based access for simultaneous searching of all NASA DAACs
- ❑ User Services Office (865-241-3952; ornldaac@ornl.gov)
 - e-mail, phone, fax, letters, walk-ins
 - multiple distribution media
 - outreach and advertisement

America Online - (ORNL Distributed Active Archive Center (DAAC) for Biogeochemical Dynamics)

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http://www.daac.ornl.gov/

Source for biogeochemical and ecological data. If your browser does not support JavaScript, please use the [Web Product Tree](#). These data are also available via anonymous FTP at <ftp://daac.ornl.gov/data>.

Oak Ridge National Laboratory Distributed Active Archive Center

ORNL DAAC: A source for biogeochemical and ecological data useful for studying environmental processes. These data have been collected on the ground, from a network of sites, and generated by computer models. The extent of data ranges from site-specific measurements to durations ranging from days to years.

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The ORNL DAAC User Interface

... example of searching by attributes

PIs recognized as authors of the data set.

Summary:

The BOREAS TE-06 team collected several data sets to examine the influence of vegetation, climate, and their interactions on the major carbon fluxes for boreal forest species. This data set contains estimates of the biomass produced by the plant species at the TE, CEV, and AUX sites in the SSA and NSA for a given year. Temporally, the data cover the years of 1985 to 1995. The plant biomass production (i.e., aboveground, belowground, understory, litterfall), spatial coverage, and temporal nature of measurements varied between the TE, CEV, and AUX sites as deemed necessary by BOREAS principal investigators.

A guide document which includes more information about this dataset can be found at http://www-ccsds.ornl.gov/boreas/TE06NPP/comp/TE06_NPP.txt.

ORNL DAAC maintains information on the entire [BOREAS Project](#).

Data Citation

The dataset should be cited as follows:

Gower, Tom and Jason G Vogel 1998. BOREAS TE-06 NPP Estimates for the BOREAS TE, CEV, and AUX Sites. Available online at <http://www-ccsds.ornl.gov/> from the ORNL Distributed Active Archive Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee, U.S.A.

America Online - (ORNL DAAC Attribute Searching)

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http://www.daac.ornl.gov/cgi-bin/DAAC/search.sh

14 Projects With 527 Data Sets

- BOREAS
- CANOPY CHEMISTRY (ACCP)
- CLIMATE COLLECTIONS
- FIFE
- FIFE FOLLOW-ON

(Too Many To Display)

(FIFE OTTER HYDRO LBA CD-ROM Packages Not Shown. Order these [Here](#).)

The Data Set Attributes Contain:

351 Investigators, **138 Parameters,**

- ABER JOHN D.
- AGREN G. I.
- AHMAD SURAIYA P.
- ANDERSON DARWIN
- ANDERSON DEAN
- AERIAL PHOTOGRAPH
- AIR TEMPERATURE
- ALBEDO
- ATMOSPHERIC EMITTED RADIATION
- ATMOSPHERIC PRESSURE

163 Sensors, **and 48 Sources**

- AAS
- ADVANCED SOLID-STATE ARRAY SPECTRORADIOMETER
- AIR THERMOMETER
- AIRBORNE VISIBLE AND INFRARED IMAGING SPECTROMETER
- ALGORITHM
- AERIAL PHOTOGRAPH
- AERO COMMANDER
- C-130
- CHIEFTAIN NAVAHO
- COMPUTER MODEL

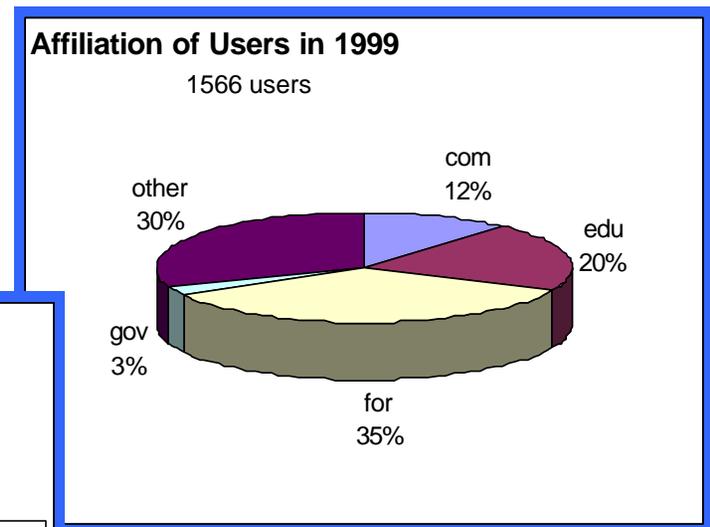
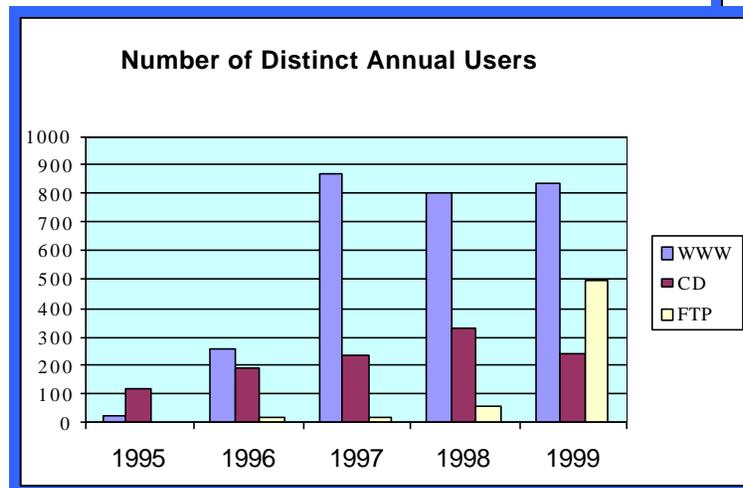
SEARCH Using My NEW Selections Or **undo** my selections.
(You must select something for SEARCH to work)

(You Will Be Unable To Download Data Set Files Until You Get The Data Set Count Under 20)

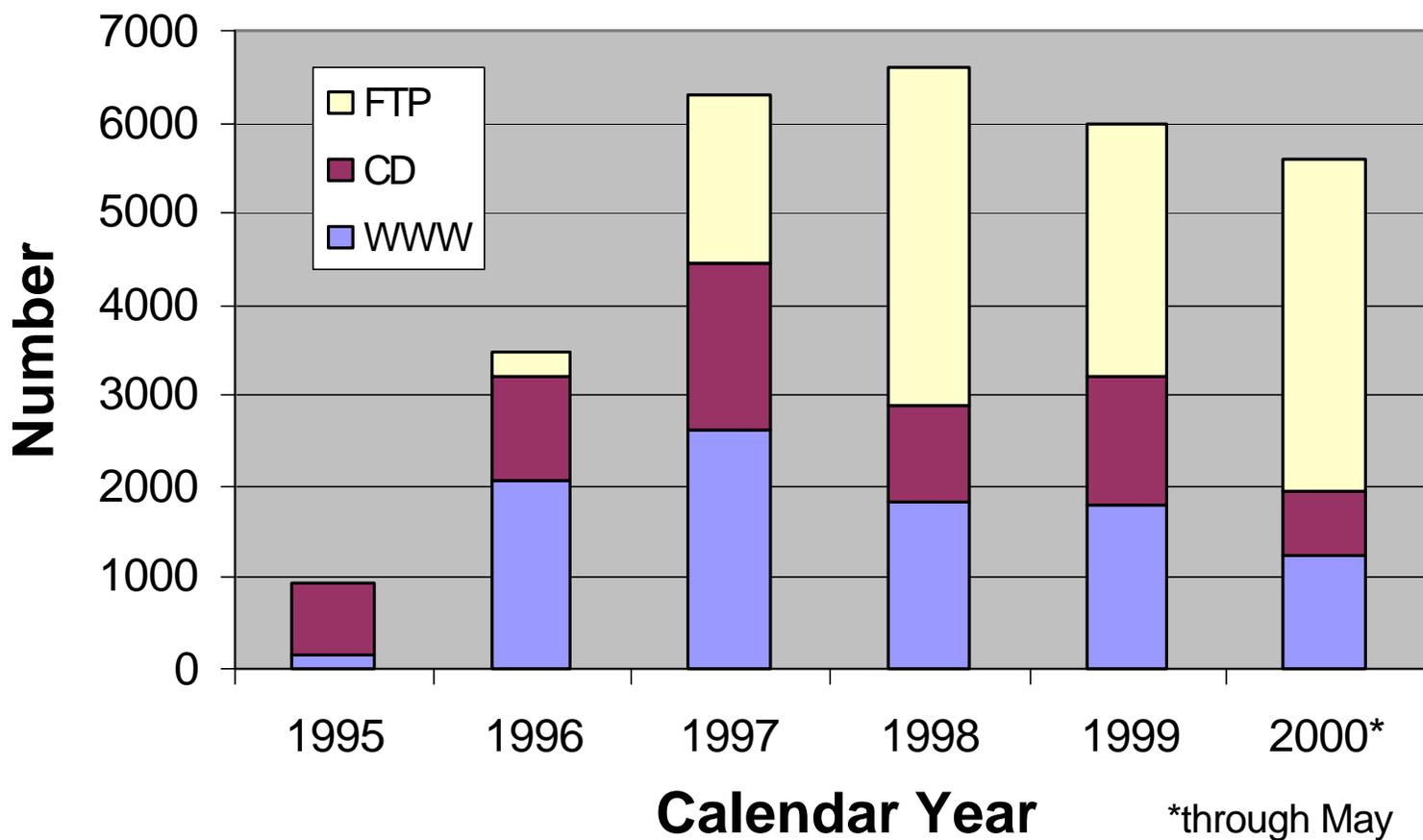
User Statistics

- Goals: - to determine if the DAAC is meeting its mission and
- to characterize the DAAC's users so that we can understand and serve users better

- Who orders data?
- How many users order DAAC data?
- What data sets are ordered?
- How many data sets (and their volume) are ordered?
- How the data are ordered and delivered?



Number of Data Products Delivered by FTP, CDs, and WWW



Steps of Data Processing and Support



❑ Acquisition

- identify how best to serve the scientific community
- establish how and when to receive data
- acquire data

❑ Ingest

- perform QA checks
- reformat for consistency
- compile project-provided metadata
- generate additional metadata
- select keywords

❑ Enhance

- add supplementary variables
- standardize to common units
- aggregate files

❑ Documentation

- collect available documentation
- write guide documents for each data set, instrument, etc., as needed

❑ Marketing and Distribution

- survey the market (users) and advertise
- provide data access to users worldwide

❑ Post-Project Data Support

- provide long-term secure archiving of the data
- serve as a buffer between end users and PIs
- provide usage statistics to data providers

❑ User Working Group

- science panel that provides advice on all aspects of the DAAC

DAAC Resources



❑ Staff

- ~ 12 full-time equivalents
- ORNL staff and subcontractors
- individuals perform multiple functions

❑ Physical resources

- hardware and software
 - Silicon Graphics servers
 - Unix, Sybase, C, Perl, Java/JavaScript, SAS
 - ORNL mass storage system for large files
 - Unix- and Windows-based workstations
- located at ESD/ORNL