American Geophysical Union
San Francisco, CA

Background: ORNL DAAC

- Oak Ridge National Laboratory (ORNL)

  ORNL is a multi program science and technology laboratory under the U.S. Department of Energy. Big place, many people, diverse projects , since 1940s.http://www.ornl.gov/

- Distributed Active Archive Center (DAAC)

  Data center for biogeochemical and ecological data and models useful in environmental research. http://daac.ornl.gov/

Today's Agenda

- What is Mercury?
- What can Mercury do for you
- Quick look at Mercury model's
- Searching data
- Key search features
- Mercury Demonstration

Finding data – Types of users

I know what I want. Do you have it?

Searching with predefined selection criteria

I am not sure what I want. I need to see what you have available

Browsing a hierarchy of availability summaries

I will know what I want when I see it

Searching with a combination of predefined selection criteria and visual review of data plots

I need to read about what you have, then I will decide

Discover areas of interest by browsing the ORNLDAAC web documentation and collect items of interest

What is Mercury

- Distributed metadata management, data discovery, and access system
- Based on a combination of open source and ORNL developed software
- Standards based – XML, FGDC, Z39.50, Dublin-Core, Darwin-Core, GCMD, EML and ISO19115

What can Mercury do?

- Provide a single portal to information contained in disparate data management systems
- Provide free text, fielded, spatial, and temporal search capabilities
- Allow individuals and database managers to distribute their data while maintaining complete control and ownership
- Leverage investment in existing information systems and research

Projects using Mercury

DAAC for biogeochemical dynamics
DISTRIBUTED ACTIVE ARCHIVE CENTER Oak Ridge National Laboratory

USGS nbii National Biological Information Infrastructure

NASA LBA

IAI DIS

DADDI
a working prototype focused on arctic coastal data

NASA Project Office
LBA-Hydrometeorology

Quality Systems Science Center NARSTO U.S. DOE / ORNL

CDIAC

NASA North American Carbon Program
MODELING AND SYNTHESIS THEMATIC DATA CENTER

iabin The United States Node of the Inter-American Biodiversity Information Network

CPTEC
Centro de Previsão de Tempo e Estudos Climáticos
Brazil
INPE

Ocean CO_2 CDIAC

Safari 2000 A Southern African Regional Science Initiative
SAFARI 2000
completed
Southern Africa

Office of Science
Science for America's Future www.science.doe.gov
U.S. Department of Energy

BigFoot

ARM

USA npn National Phenology Network

Two Mercury Models

- The Virtual Internet Database

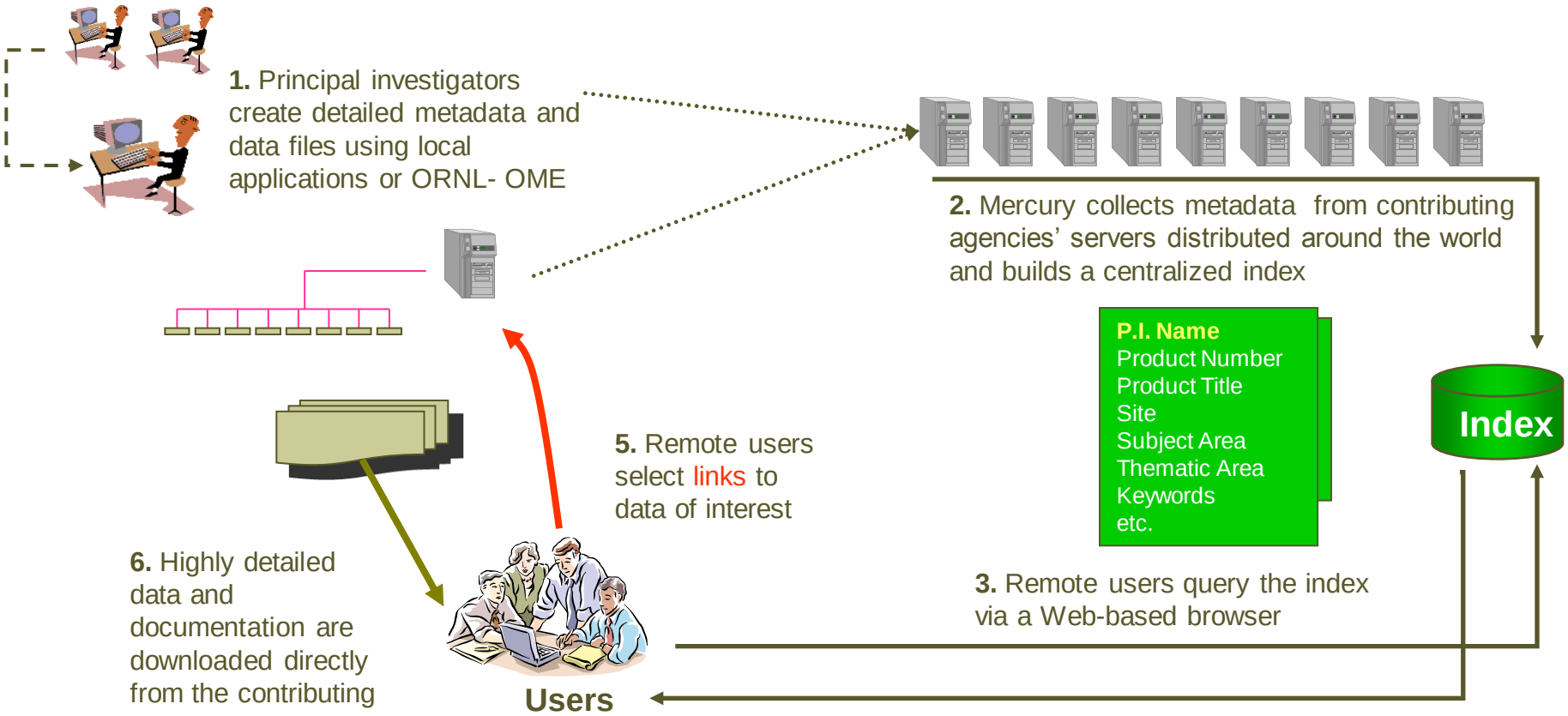
  Organizes a new collection of data from informal systems spread across the Internet

- The Virtual Aggregate Database

  Harvests information from existing formal separate DBMS

- Many hybrids

Mercury – A Virtual Internet Database



P.I. Summary – Olson J. S Global Organic Soil Carbon
Project: Soil Collections
Status: Completed
Download Data Set:
http://daac.ornl.gov/cgi-bin/cart/order.pl?ds_id=221

Mercury - key features

- ORNL DAAC – Simple Search & Advanced Search
- Flexible architecture - can handle multiple search services, scalable, easily extendable
- Rich client user Interfaces
- Detailed results summary - Filtering, dynamics sorting, and book marking of search results
- Has the ability to provide the harvested metadata to other applications (e.g.., Google, GCMD, GeoOneStop, NBII Biobot)
- Semantic web integration support (thesaurus service)
- Seamless data ordering/data extraction functionalities
- External data visualization tools integration
- User Statistics Collection
- SOAP (Simple Object Access Protocol) based design supports Web services

ORNL DAAC Mercury Instance

- **Search Technology using popular open source tools**
- **More than 8000 searchable metadata records**

Currently Archiving data from:

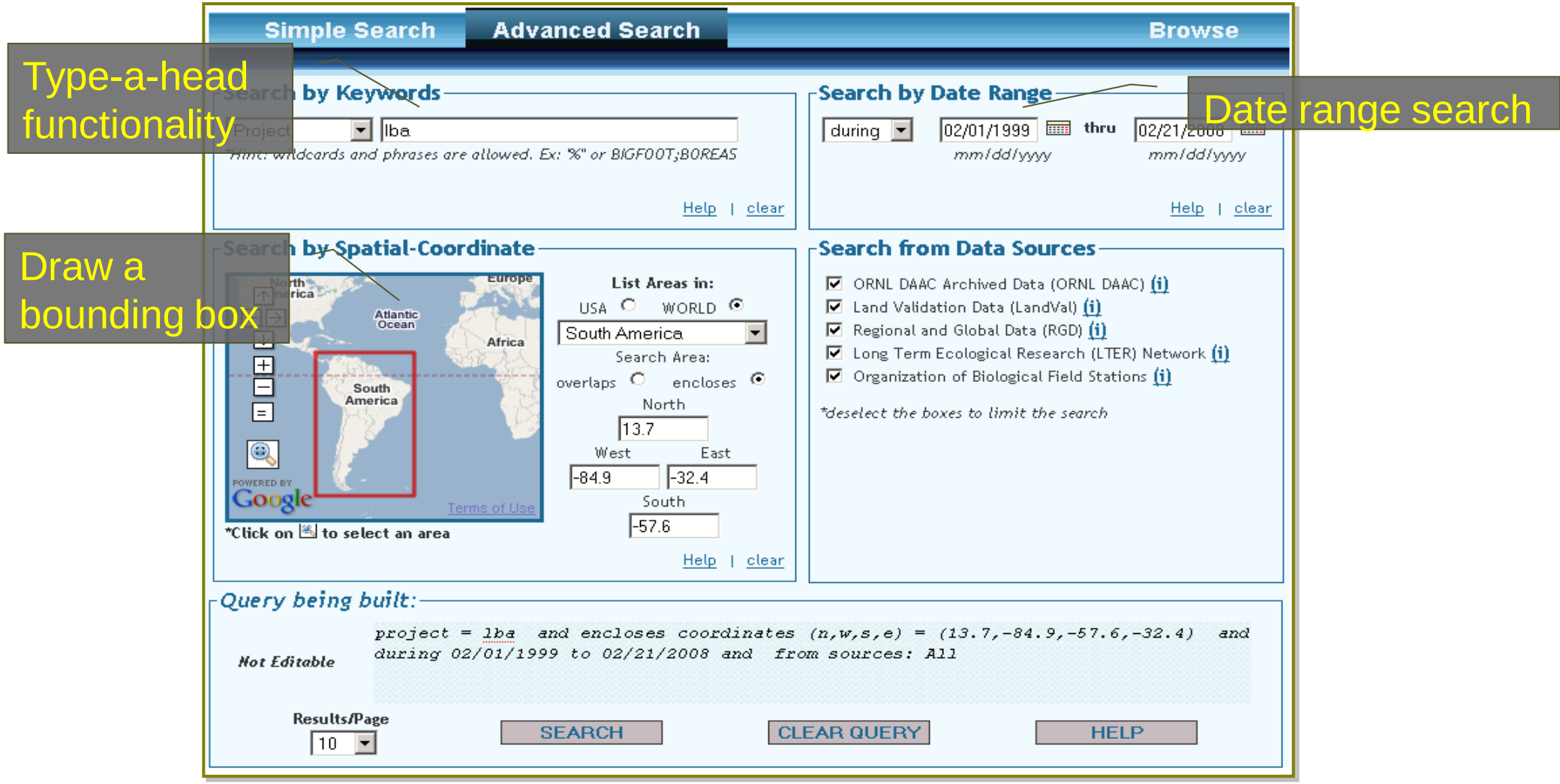
- ORNL DAAC (Distributed Active Archive Center) Archived Data
- Regional and Global Data
- Land Validation Data
- LTER Data (Long Term Ecological Research)
- Organization of Biological Field Stations
- Land Processes Distributed Active Archive Center (LP DAAC)

Simple Mercury Search (google like search)

- http://mercury.ornl.gov/ornldaac/index.jsp?tab=simple
- http://daac.ornl.gov

Advanced Mercury Search

- http://mercury.ornl.gov/ornldaac/index.jsp?tab=advanced



Web browse Tree

Typical Mercury Search Results Screen

Search result can be bookmarked, emailed or used as an RSS feed

Filtering the search results

Sorting and navigating the results

Brief results with links to order the data or view full metadata record

ORNL DAAC Mercury Demo

Search Scenario

1. Search for “Climate data" for data source: ORNL DAAC and find **‘VEMAP 2: U.S. ANNUAL CLIMATE CHANGE SCENARIOS’** dataset

2. Select a bounding box around North America and do an advanced search; do the same using other search engines (Example: Google) and compare the results

- http://mercury.ornl.gov/ornldaac

MERCURY Homepage:

- http://mercury.ornl.gov

-Detailed information about Mercury and Mercury Projects

-Access to Metadata Editors

NASA

References:

Palanisamy,G.; Wilson,B.E.; Devarakonda,R.; Green,J.M.,Mercury-Distributed Metadata Management, Data Discovery and Access System, American Geophysical Union, Fall Meeting 2007, abstract #IN31C-05

Devarakonda,R.; Palanisamy,G.; Green,J.; Wilson,B.E..,Mercury: An Example of Effective Software Reuse for Metadata Management, Data Discovery and Access American Geophysical Union, Fall Meeting 2008, abstract #IN11A-1019

Devarakonda R, Palanisamy G, Green J,Wilson, B E (2009) Mercury: Reusable software application for Metadata Management, Data Discovery and Access, Eos Trans. AGU 90(52), Fall Meet. Suppl., Abstract #IN11C-1060

GiriprakashPalanisamy, Bruce Wilson, Jim Green, Ranjeet Devarakonda; Mercury-A Distributed Metadata Management, Data Discovery and Access System, EcoinformaticsConferenceService,EnvironmentalInformation Management 2008; Avalable at: https://conference.ecoinformatics.org/index.php/eim/eim2008/paper/view/52

Devarakonda R, Palanisamy G, Wilson BE, Green J; (2010) Mercury: reusable metadata management, data discovery and access system, Earth Science Informatics DOI: 10.1007/s12145-010-0050-7

Additional:

Mercury Home page: http://mercury.ornl.gov
Daac Home page: http://daac.ornl.gov