NACP Modeling and Synthesis Thematic Data Center (MAST-DC):

Update for MCI (August 7, 2007)

A project funded by
NASA 2005 Research Announcement for the North American Carbon Program
Period: 2006-2009

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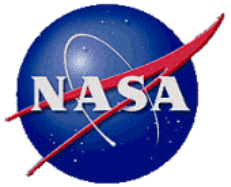


Goals Of MAST-DC

- Support NACP by providing data management services to NACP investigators and agencies performing modeling and synthesis activities
- Based on NACP requirements established, MAST-DC will provide data products and services in a central location, in consistent and uniform grids, with common and co-registered spatial projection, in easily converted formats
- Free modelers and those doing the synthesis and integration from having to perform data management functions

MAST-DC Services

http://nacp.ornl.gov/mast-dc/

- Data products
- MCI Web page
- WebGIS
- Data Clearinghouse: Mercury
  - Thematic Data Centers
- Data Server (netCDF / THREDDS)

Mid-Continent Intensive: Selected Data

Please send links to additional data sources for MCI

http://nacp.ornl.gov/mast-dc/mci.shtml

- Boundary for Mid-Continent Intensive
- WebGIS for North America
- Flux Tower Data
  - AmeriFlux
  - Flux Tower Site Characterization Map Layers – from AmeriFlux
  - FLUXNET
- Carbon Dioxide Measurements
  - NOAA ESRL GMD Tall Tower and Aircraft Network - Data
  - "Ring 2": High-precision, high-accuracy CO2 mixing ratio measurements in support of the North American Carbon Program Mid Continent Intensive
  - Total Carbon Column Observing Network
- ChEAS: Chequamegon Ecosystem Atmosphere Study

North America WebGIS Features

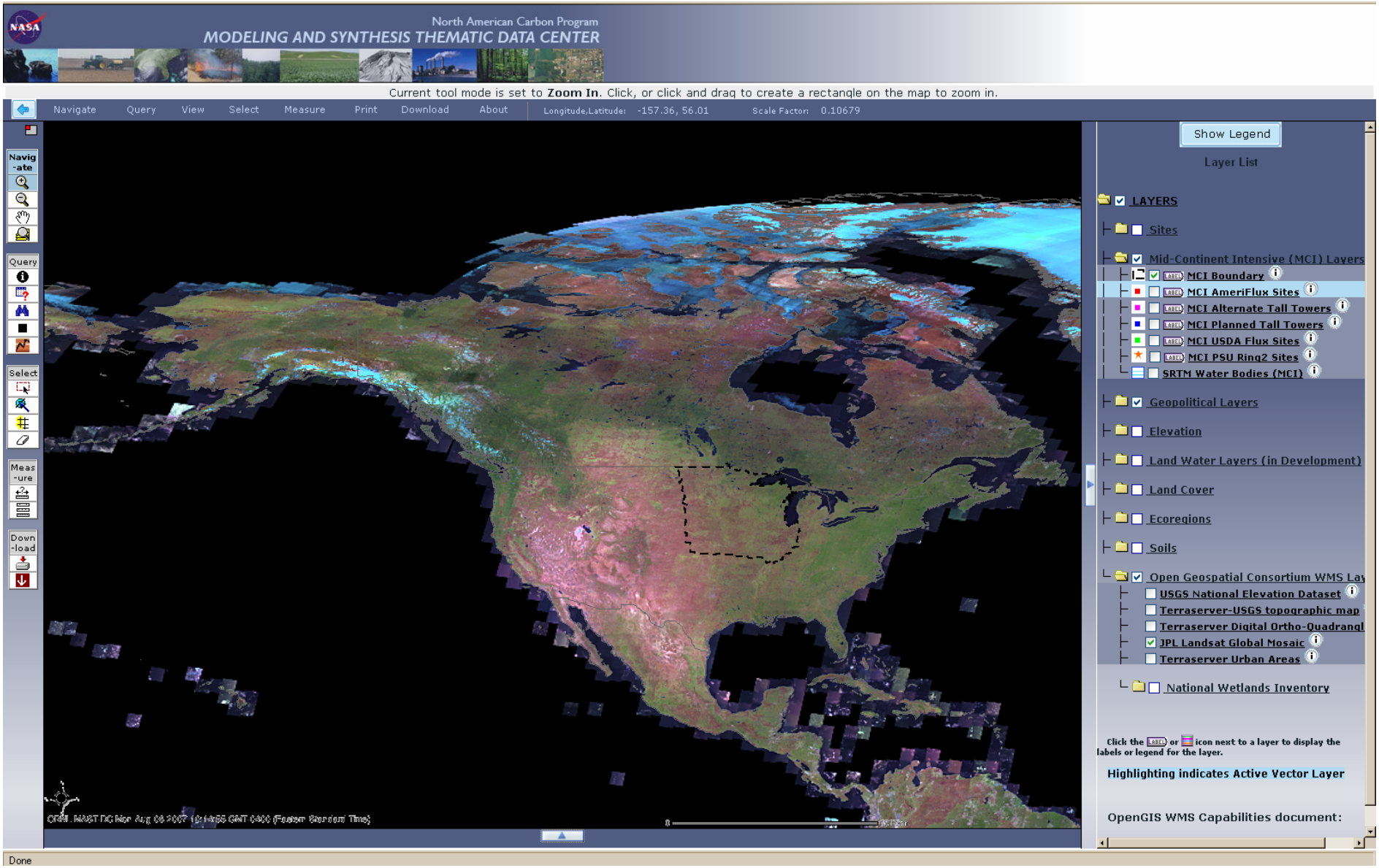
http://webmap.ornl.gov/Website/daac_NM_beta1/viewer.htm?INSTANCE=MCI

- Users can interrogate map features and extract and download selected map features, including map layers (shape files)

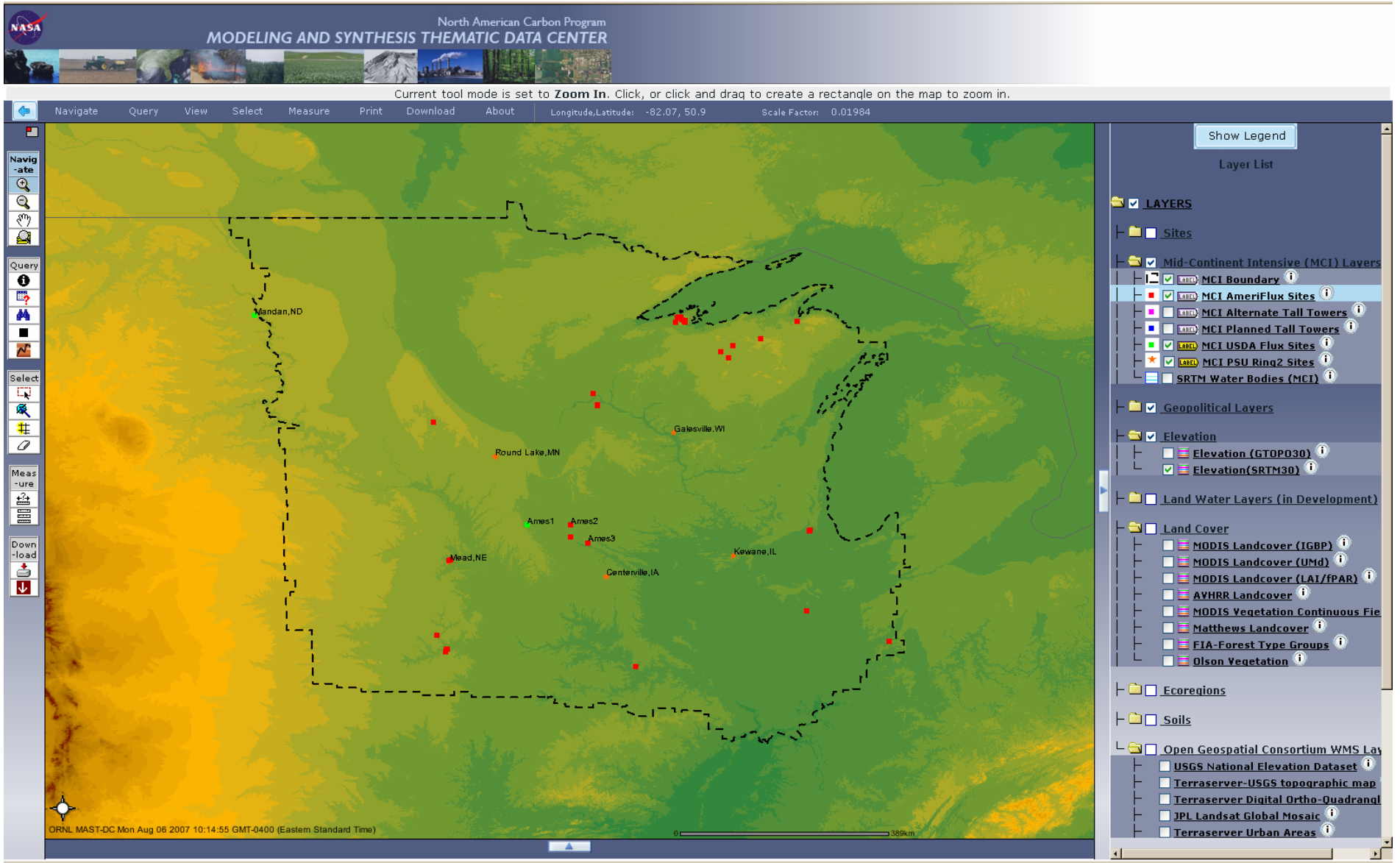
Technical specs:

- North America WebGIS supports Web Map Service (WMS) and Web Coverage Service (WCS) OpenGIS protocols
  - Includes land cover, biophysical, elevation, and geopolitical layers
  - Provides access to other Open Geospatial Consortium (OGC) layers

WebGIS for North America



MCI Information on WebGIS



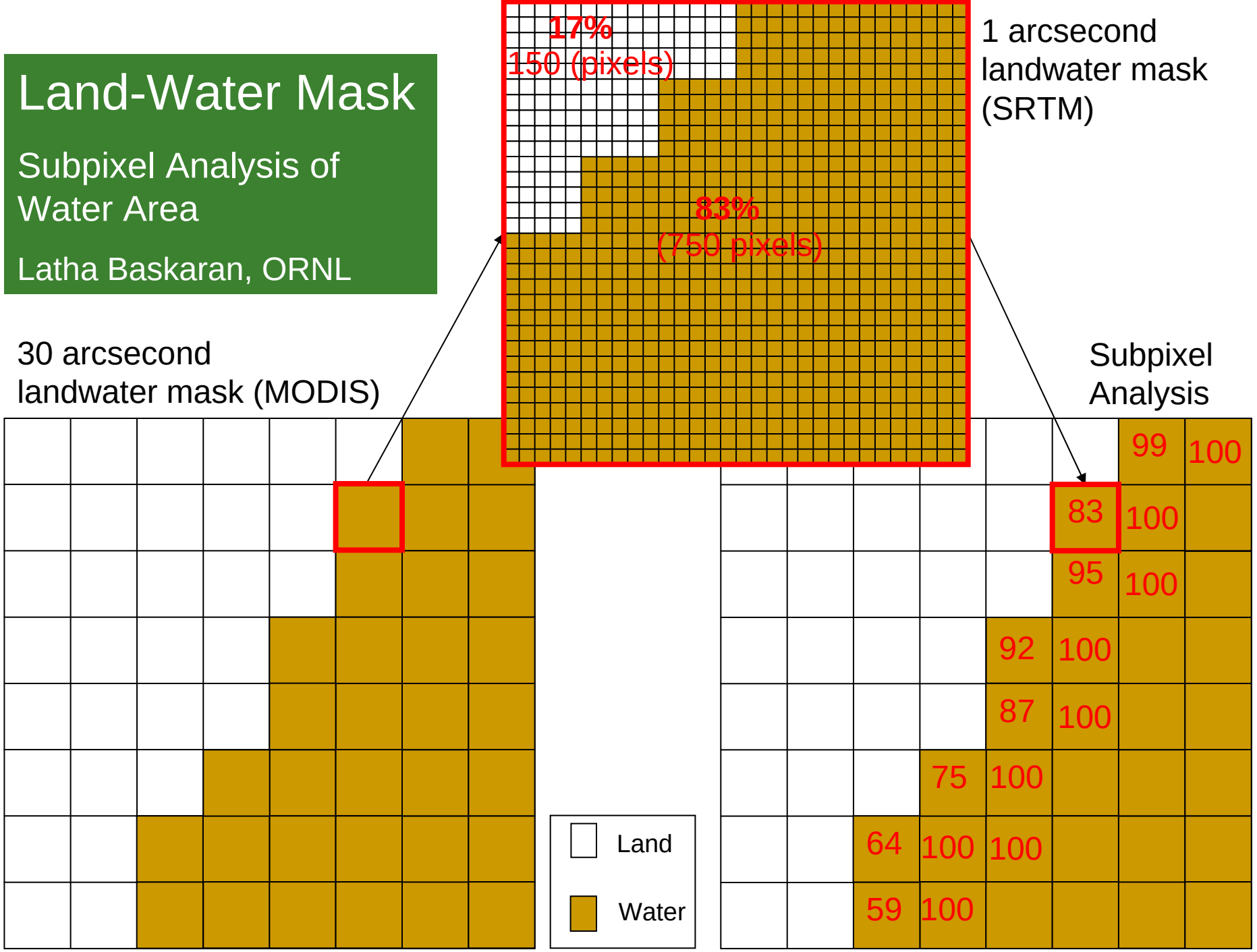
MAST-DC Data Activities

- DAYMET (NCAR) (continental focus)
  - Currently have daily, 1-km data from 1980 to 2004, with annual updates
  - Working with Canada and Mexico to extend DAYMET to North America
- Digital Elevation based on Shuttle Radar Topographic Mission
- Land-Water Analysis at sub 1-km pixel

Land-Water Mask

Subpixel Analysis of Water Area

Latha Baskaran, ORNL



Data Server and Subsetting Tool

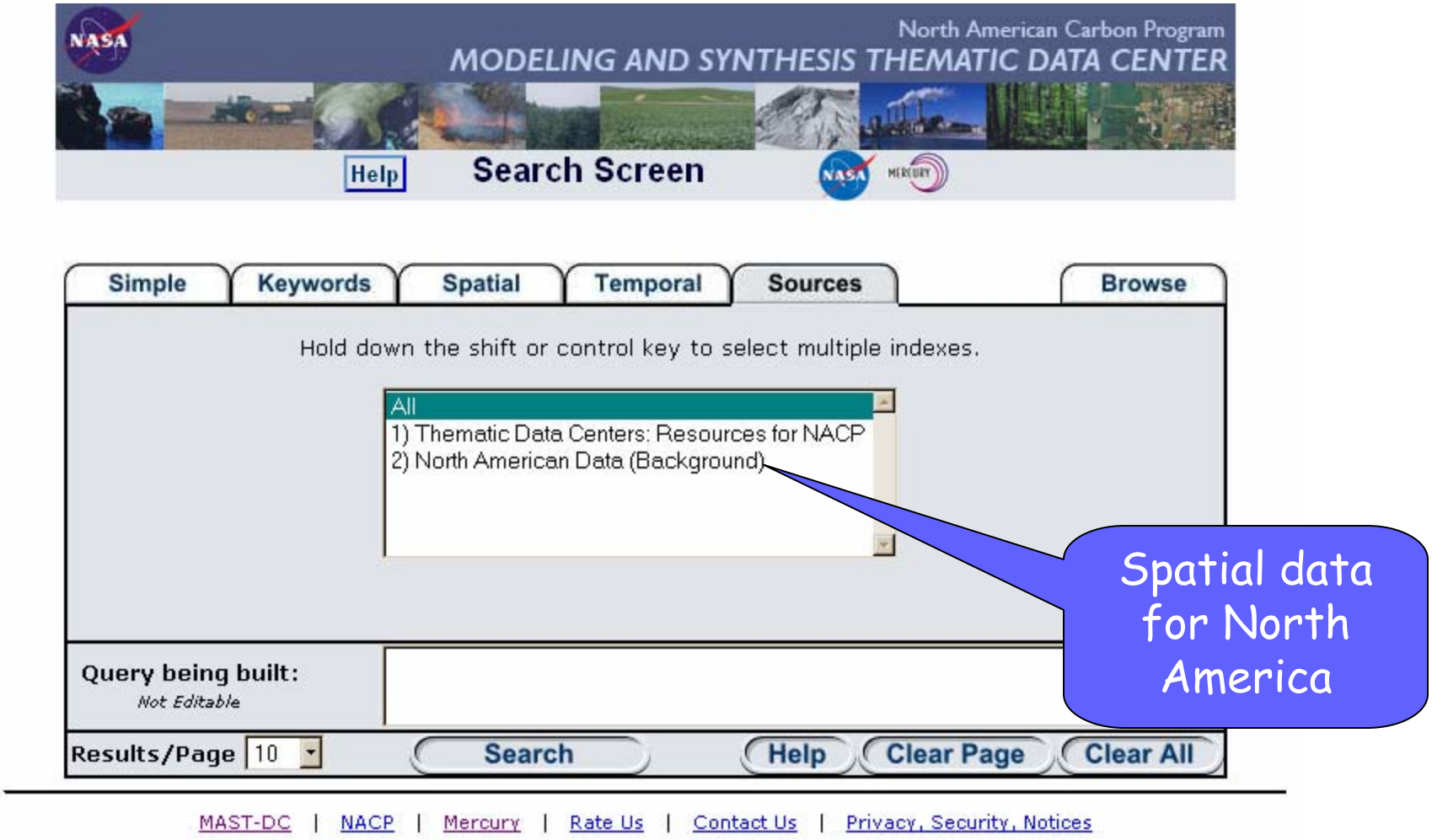
- MAST-DC is in the process of developing an Data Server with some services

  http://daacdap-dev/thredds/catalog/ameriflux/catalog.html

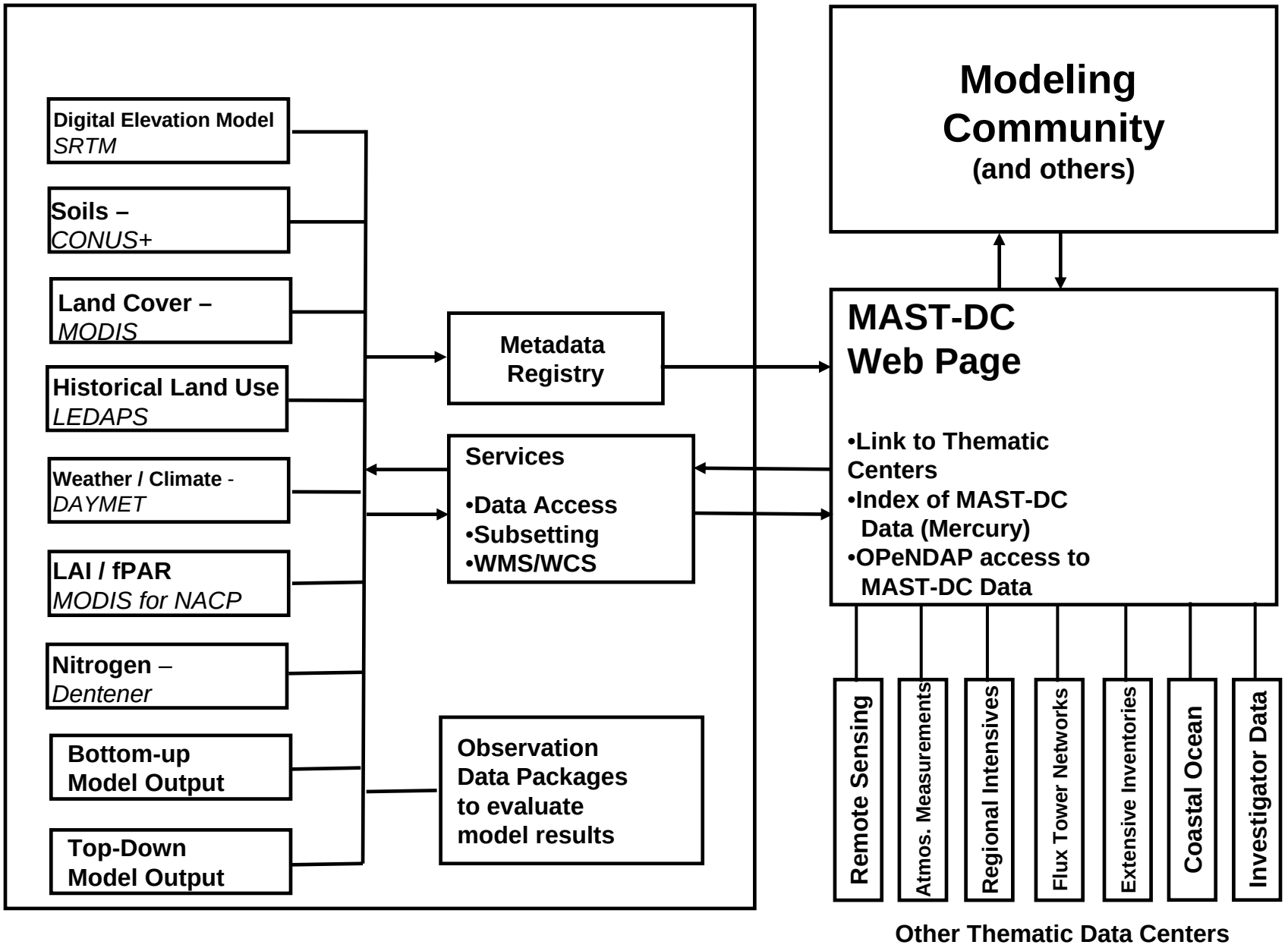
  - Files are in netCDF, being served by THREDDS OPeNDAP server
  - Subsetting: selecting parts of the data files (in ASCII format) based on parameters entered
  - Test mode, in development (URL available on August 13)

MAST-DC Search (based on Mercury)

http://mercury.ornl.gov/mastdc/



Framework for MAST-DC



Key NACP Data Dependencies (U.S. Agencies)

USDA

- Forest & soil inventories
- Agricultural, forest and range management
- Carbon sequestration

NOAA

- Meteorological observations
- Ocean surface temperature and land cover observations
- Atm. CO_2 flask/tall tower network
- Weather models (NCEP)
- Air-Sea CO_2 exchange studies
- Integrated carbon modeling
- Ship-based ocean CO_2 surveys

DOE

- Fossil fuel emissions
- AmeriFlux
- FACE and other CO_2 expts.
- Carbon databases (CDIAC)
- C modeling & C sequestration
- ARM Project

USGS

- Landsat data & data products
- Topography & land cover maps
- Stream gauge network
- Hydrography

NASA

- Remote sensing: satellite time series (Landsat, SeaWiFS, and EOS); airborne sensors
- Remote sensing research
- Field campaigns— BOREAS
- Ocean, land, atmosphere and coupled carbon-climate modeling
- ESTO & DIS

NSF

- Earth science research
- Ocean campaigns
- Process studies
- NCAR, NCEAS, LTER
- CyberInfrastructure Initiative

Slide courtesy of Lisa Dilling, 2004

Thematic Data Centers

- Thematic data centers are national or agency archives that have existing data products relevant to NACP
- Data collected as part of agency's mission or activities
  - Link to NACP may be indirect (NACP investigators are just another set of users)
  - Some are more tightly linked to NACP (AmeriFlux)
- Establish coordination / cooperation agreements to ensure that agency and national data resources are available to NACP researchers

Thematic Data Centers: Resources for NACP

http://nacp.ornl.gov/mast-dc/thematic_data_centers.shtml

Digital Elevation	Wetlands
Remote Sensing: Land Cover / Land Cover Change	Remote Sensing: Biophysical Data
Remote Sensing: Radiation Data	Biomass
Crop Inventory	Fire Data
Flux tower	Aircraft Flux
Emissions	Soils
Permafrost / Freeze Thaw	Atmospheric Carbon Dioxide
Atmospheric Transport	Weather
Climate Scenarios	Hydrology
Intensive Field Activities	OCCC
Modeling and Synthesis Thematic Data Center	IPCC Model Output

NACP Office Activities

http://www.nacarbon.org/cgi-nacp/web/investigations/search_data_products.pl

- NACP office has solicited information on data products on behalf of MCI
  - What data products will be produced?
  - What data products will be required from others?
  - Information:
    - When?, What?, Who will produce / use? URLs?
  - Participation has been modest
    - Please contribute information about the data products you will contribute or need for your project(s)