

NCDC GRID and NOMADS Approach Team

Kickoff Meeting

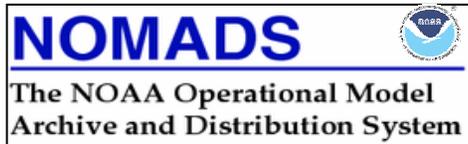
June 18th, 2004

Participants:

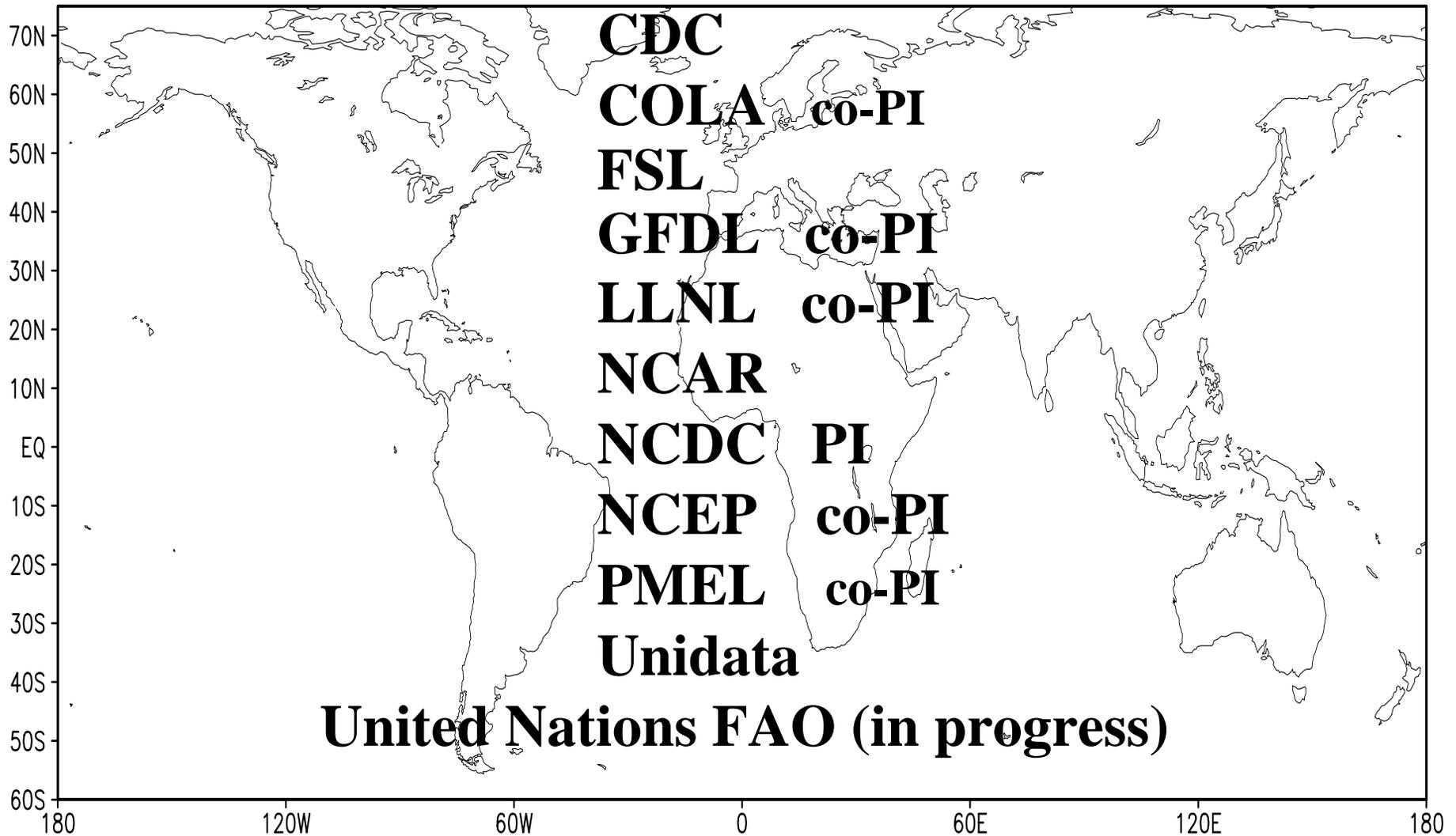
<u>CSD</u>	<u>DO</u>	<u>DOD</u>	<u>ScSD</u>	<u>RSAD</u>	<u>SSD</u>
Vicki Wright	Tom Karl	Wayne Faas	Glenn Rutledge	Brian Nelson	Preston Carter
	Sharon LeDuc	Gus Shumbura	Dave Anderson		
	John Jenson				

Advancement of GRID & NOMADS Related Activities

- Purpose
 - Identify areas of internal and external activities to advance both NOMADS (Web/GIS), and GRID based technologies
- Scope
 - NOMADS
 - Work to add new datasets including Satellite, Radar, and in-situ. Dvlp linkages to CLASS.
 - GRID
 - Participate in existing Gird partnerships and work to promote these activities at the NOAA level.



The Partnerships





NOMADS
 The NOAA Operational Model
 Archive and Distribution System

NCDC System Architecture

NOAAPort



Data Ingest

Obs, Eta,
GFS, RUC

Hi-Res
GFS, Eta,
NARR and
GDAS

Dual
Redundant
Ingest

Data Management

- Data & Directory structures “merged”
- Daily Data Ingest inter-comparison
- QC and R/T Monitoring
- Index File generation
- Control and OPeNDAP metadata generation
- CVS Backup (code)
- NCDC Archive Interface

Data Access

Earth System
Grid &
CEOS-Grid

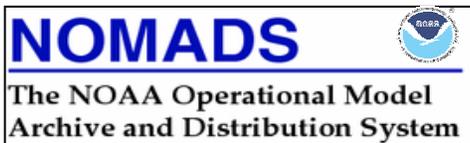
NOMADS
Web/DODS

NCDC
Archive

NCEP ftp
GigaPOP

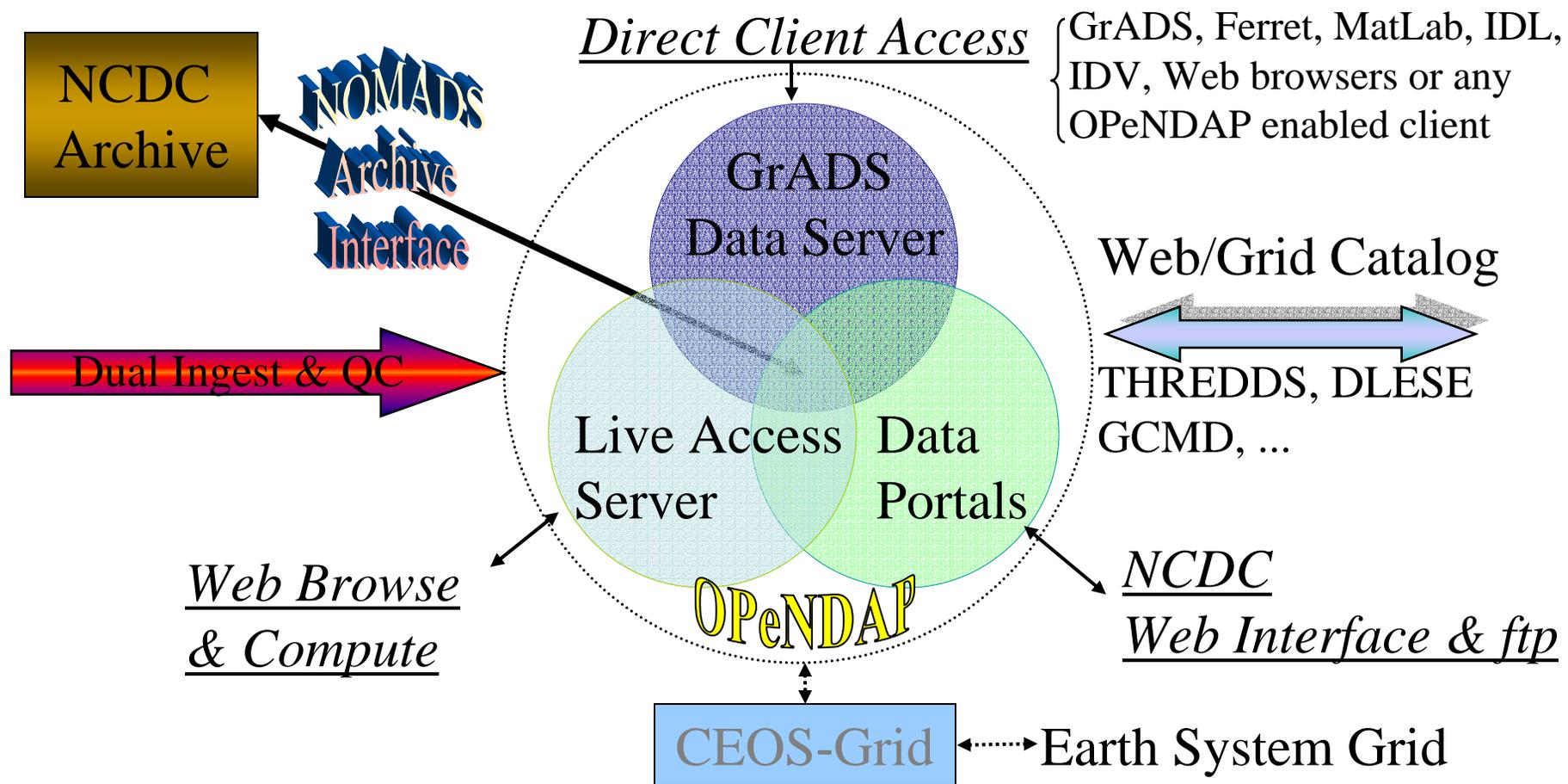
Unidata IDD

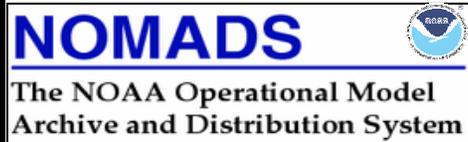




The NOMADS Philosophy

Multiple paths to format independent data access:





NCDC Grid & NOMADS Team

- ❑ The following slides are suggested activities divided into NCDC Divisions for both the sake of clarity, and to provide Division level oversight. It is also provided to initiate team discussion.

- ❑ The activities are based upon an analysis of what is doable under the current NOMADS and exiting Grid efforts as I perceive them.

- ❑ The activities are divided into two sections: “NOMADS” and “Grid”

NOMADS Related Activities 1

- Focus: ScSD-DOD-CSD
- NCDC (Faas/Lott/Rutledge) are advancing NOMADS into CSD. A comprehensive plan has been developed and most functionally already tested that will provide NOMADS capabilities within CSD. This effort will use NOMADS to service SRRS model and bufr observations; and NDFD Grib2 products for internal and external users. It is partially funded by NWS. This activity is on track.
- *Recommendation:* None.

NOMADS Related Activities 2

- Focus: ScSD-CSD
- If NCDC is to advance distributed access, beyond SRRS and NDFD datasets especially in the OGC (GIS) environment, an additional CSD resource is suggested on the team.
- *Recommendation:* A new CSD member to attend and participate in NOMADS activities in the broader external community specifically ESP, THREDDS, and OPeNDAP communities, to leverage the work of Web-OGC-Grid and relational database efforts already underway.

NOMADS Activities 3

- Focus: All Divisions
- The ScSD NOMADS activity draws upon resources across all NCDC Divisions. This inter-Divisional effort, thru cooperation at the working level has proven quite successful. On a monthly basis, NOMADS currently provides 100,000's of downloads per month.
- Active participation include: Systems, Ingest, Access (thru NOMADS and now thru the CSD) and Archive branches have all contributed to this success.
- *Recommendation:* New data/product development

NOMADS Activities 4

- Focus: ScSD
- The development of a ScSD “Reanalysis” effort, which includes a model-to-observational inter-comparison effort, is currently stalled. Oversight of the NOMADS activities, including the Grid, has been more time consuming than anticipated.
- *Recommendation:* A new modeler resource to develop long-term dynamically driven improvements to observations. Engage others ScSD.

NOMADS Activities 5

- Focus: RSAD, ScSD
- CLASS has the (longer term) capability to provide distributed (OPeNDAP) and Grid-based technologies (XML/NetCDF, etc.).
- Recommendation: Work toward the converge of a NOMADS-CLASS interface. Metadata “standards” & conventions are key.

The Grid

- Focus: RSAD, SSD and ScSD
- This effort will require collaboration with external Grid partners. There are two major groups that NOMADS is currently engaged: Earth System Grid through the ESP; and the CEOS-Grid.
- Caution: Direct involvement with the Earth System Systems Grid and CEOS-Grid should be maintained since CEOS-Grid and ESG may be on divergent paths (at least for the present time). CEOS has a focus on satellite, while ESG has a focus on Model. This needs to be monitored for a comprehensive long-term NOAA grid infrastructure to emerge.

Grid Activities 1

- Focus: RSAD, ScSD, SSD
- NOMADS is an active participant within the CEOS-Grid. NCDC has a Globus server w/ GridFTP capabilities in a pilot environment across the CEOS-Grid partners (several groups for the specific application of data transfer and inter-comparison).
- *Recommendation:* RSAD, and SSD join in on CEOS-Grid monthly telecoms and ESP/NOMADS users and working groups already established. SSD involvement would be significant.

Grid Activities 2

- Focus: RSAD, SSD, ScSD
- Forecast System Lab (FSL) has initiated a NOAA grid infrastructure effort. NCDC thru NOMADS-ESP has been requested to collaborate with GFDL and FSL.
- *Recommendation:* RSAD, SSD join in on ScSD discussions toward a “DataGrid” pilot within NOAA. NCDC (w/DO), FSL, and GFDL conduct NOAA level briefings on both grid, ESP and NOMADS.

Grid Activities 3

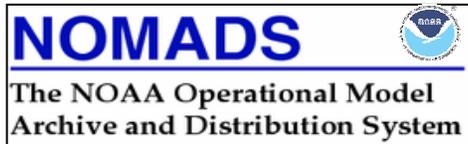
- Focus: DOD, ScSD
- Distributed access to Radar data could be a DOD activity. U of Alabama has developed an ESML-OPeNDAP Radar Level-II interface. ESG (NCAR) has developed an OPeNDAP-G interface.
- *Recommendation:* DOD and ScSD develop “NOMADS Radar Server” based on these open technologies with U of AL and ESG.

Grid Activities 4

- Focus: RSAD ScSD and SSD
- Model to Satellite data effort w/ GMU. GMU has successfully collaborated with NOMADS for a satellite (modis) to model (Eta) format “converter to display and make avbl these data through OGC (GIS) services.
- *Recommendation:* RSAD and SSD participate in CEOS-Grid (w/ ScSD) for the development of metadata and the NOMADS-GMU collaboration.

External Collaborations

- NOMADS has developed many external collaborations. NCDC can participate in those that advance NCDC and NOAA goals.
- The following programs are already interested in partnering. They include National and International projects:



Collaborating Programs

CAP Climate Action Partnership
CDP Community Data Portal
CEOSGrid Committee on EO Satellites
CEOP Coordinated Earth Obs Period
EPA Air Quality Models
ESP Earth Science Portal
European PRISM
NASA GCMD
NERC DataGrid + BADC
NSF Cyberinfrastructure
NSF LEAD GTF GeoScience Tech Forum
NVOADS / US GODAE / GOOS
Unidata THREDDS, NSDL, DLESSE
WCRP World Climate Research Program
WMO

DOC DOE EPA State Dept
NCAR
NOAA Representative
NOAA Representative
(in progress)
Member

Science Advisory Board
Advisory Committee
Member
Planning Committee
Data Provider
Data Provider
JSC/CLIVAR
(in progress)

Geosciences Technology Forum

[Newsletter](#)[Mail lists](#)[Calendar](#)[Other ITR Efforts](#)[LEAD Internal](#)[National Conferences](#)[Public Relations](#)[Technology Links](#)[Grid Technology Links](#)[Meteorology Links](#)[Real Time Forecasts](#)

Working with National Agencies, professional societies and other appropriate entities, LEAD will establish the *National Geosciences Technology Forum (GTF)*. Similar in concept and with strong ties to the Open Grid Forum (OGF) and similar groups, the GTF will serve as a focal point for dialog on cyberinfrastructure in geosciences with particular emphasis on linking IT systems and sharing knowledge and resources.

The Planning Committee is working on the agenda of the first GTF meeting, which will be held on 18-19 October 2004 in the Washington DC area. The [GTF Concept Paper](#), prepared by the LEAD Principal Investigators, describes the GTF vision.

<http://lead.ou.edu/gtf.htm>



LEAD is funded by the
[National Science
Foundation](#).

The Grid: An IT Infrastructure for NOAA in the 21st Century

Mark Govett, Mike Doney, Paul Hyder



- **To meet challenges facing NOAA in the next decade and beyond**
 - **100 Fold Increase in Data Volume in 10 years**
 - GOES-R, NPOESS, IEOS, Radar, GPS
 - **More Complex Modeling Systems**
 - higher resolutions, ensembles, data assimilation, more data
- **Proposes an Integrated IT Infrastructure based on Grids**
 - **Build on existing NOAA Programs (e.g. CLASS, NOMADS)**
 - **Develop Compute, Data and Service Grids**
 - **Enable Dynamic Data Discovery, Access, Integration**
 - **Utilize / Develop Web Services, Grid Portals**

Suggested Reading

- NOMADS

- <http://www.ncdc.noaa.gov/oa/model/model-resources.html>
- <http://www.ncdc.noaa.gov/oa/climate/nomads/nomads.html>
- <http://www.ncdc.noaa.gov/oa/climate/nomads/program-plan.html>
- <http://www.ncdc.noaa.gov/oa/model/publications/publications.html>

- Earth Science Portal

- <http://esportal.gfdl.noaa.gov/>

- Earth System Grid

- <https://www.earthsystemgrid.org/>

- CEOS-Grid

- <http://www.ncdc.noaa.gov/oa/climate/nomads/ceos-grid-plan-20020905.pdf> and
- <http://grid-tech.ceos.org/gridwiki>
(username/password - ceos-grid/grid-tech)

Next Steps?