

Expanding Public Access to Weather Observational Data and Model Archives NEMAC Research Project Final Report

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The purpose of this project was to facilitate the availability of weather model archive data for scientists and the general public. To attain this I worked for the NOAA National Operational Model Archive and Distribution Systems (NOMADS) project at the National Climatic Data Center (NCDC) in Asheville. NOMADS was developed to meet increasing requests for online access to weather model data.

Three Web projects I worked on greatly enhanced the availability of model and observational data: the NOMADS Live Access Server, the restructuring and redesign of the NOMADS Web site, and an interface to the NWS Service Records Retention System (SRRS).

NOMADS Live Access Server

The efforts to merge the NOMADS Live Access Server (LAS) to the existing GrADS Data Server (GDS) were met with several challenges, particularly surrounding dataset aggregation and incorporation of in-situ data. The NCDC LAS (<http://nomads.ncdc.noaa.gov:8085/las/servlets/dataset>) requires OPeNDAP data to be aggregated. NOMADS has successfully implemented the LAS with several model archive datasets including the Global Forecast System (GFS), the North American Meso-scale (NAM, formally Eta), the North American Regional Reanalysis (NARR), and the NWS Service Records Retention System (SRRS), the legally mandated NWS required archive suite of data. NOMADS then investigated a real-time access system for these data. However updating LAS for the high volume real-time numerical weather prediction is computationally expensive, taking nine hours to complete. NOMADS is investigating whether we can improve the performance of these

update scripts or whether we need to break the aggregate sets into large archives and smaller, frequently-updated real-time datasets.

Additionally, a NOMADS goal is to provide NCDC reference quality in-situ datasets. One such dataset is the Integrated Global Radiosonde Archive (IGRA, formerly the Comprehensive Aerological Radiosonde Dataset or CARDS) dataset currently served from the NOMADS GDS into the LAS. Unfortunately the LAS is unable to handle GDS sequence data without construction of a dataset-specific driver. To overcome this limitation, the dataset was placed into a “mysql” database and used an existing LAS ocean dataset driver to serve the data. This dataset remains in experimental phase, however, pending a process to keep the mysql database updated and the development of advanced LAS display capabilities for land-based in-situ datasets. The PMEL LAS software developers are working on a generic in-situ dataset driver and it is hoped that the NCDC NOMADS efforts can assist in this development.

I also researched issues surrounding interpolation side effects when gridding observational data or regridding models for intercomparisons. Observational data is often much sparser than model data and is challenging to interpolate onto a grid with comparable resolution, something required for comparison. Regridding a high-resolution model onto another of similar density but a different grid is scientifically valid but can result in anomalies which bear further investigation.

NOMADS Web Enhancements

The expansion of the NOMADS project and new dataset availability resulted in a disjoint collection of Web pages with confusing navigation. The NOMADS Web site contained hundreds of pages of documentation and instructions developed on an as-needed basis. Many of these pages were not cross-referenced and contained redundant information. I consolidated this information into a more intuitive, user-friendly site (<http://nomads.ncdc.noaa.gov>) which

includes a new user guide developed by a coworker. Future plans are to expand the user guide and to compartmentalize dataset documentation using PHP in order to offer information to the user in multiple formats based upon individual need.

Service Records Retention System

The Service Records Retention System (SRRS) is the legally mandated National Weather Service required archive suite of data. I worked with a team programmers and meteorologists to meet the federal requirements for public access to archives. This product has been completed and tested and will be opened to the public next week

(<http://nomads.ncdc.noaa.gov:9091/ncep/NCEP>).

While this project was not completed within the duration of the original NEMAC dates, it has since been completed, quality tested, and opened to the public. I will be training Customer Services Representatives to utilize the site to pull records, and I am also working on improving the performance of the servlets.

Acronyms

GDS	GrADS Data Server
GrADS	Grid Analysis and Display System
LAS	Live Access Server
NCDC	National Climatic Data Center
NOAA	National Oceanic and Atmospheric Administration
NOMADS	NOAA National Operational Model Archive and Distribution System
OPeNDAP	Open-source Project for a Network Data Access Protocol
SRRS	Service Records Retention System
NWS	National Weather Service

References

Rutledge, G., Brinegar, D., Alpert, J., Swank, D., Fey, A. & Seablom. (scheduled for publishing 2006). *The NOAA National Operational Model Archive and Distribution System (NOMADS): Growing Pains and a Look to the Future*. 22nd Conference on Interactive Information Processing Systems (IIPS), 29 January – 2 February, 2006, Atlanta, Georgia.