
Nobuki Matsui

880 West Moorhead Cir., Unit 3C, Boulder CO 80305 • 303-521-3103 (Mobile) & 303-497-6500 (Work) •
nobuki.matsui@noaa.gov, <http://www.esrl.noaa.gov/psd/people/nobuki.matsui/>

Education

BA, Mathematics, University of Colorado at Boulder, August 9, 2004.

MA, Computational Linguistics (Ph D Program), concentration in acoustic phonetics and speech recognition, University of Colorado at Boulder (1993).

BA, Political Science, Kwansai Gakuin University (1990).

Computing Skills

- Programming skills in IDL, Mathematica, MATLAB, Fortran, C++/C, Unix shell scripts, MPI, PHP, Perl, Python, Tk, S Plus, R, SQL, Object Oriented/Complex Data Structure Programming, Joomla and Html.
 - Knowledge of artificial Intelligence such as Hidden Markov Model, K Nearest Neighbor, Neural Network, and Decisions Trees.
 - Course work in data structures, database system, and UNIX system administration.
-

Professional Experience

Professional Research Assistant II, University of Colorado at Boulder/Cooperative Institute for Research in Environmental Science (CIRES), Physical Science Division (PSD), Earth Observing System Laboratory (ESRL), National Oceanic and Atmospheric Administrations (NOAA). September 2004 - present.

Student Assistant, University of Colorado at Boulder/Cooperative Institute for Research in Environmental Science, Surface Radiation Research Laboratory, National Oceanic and Atmospheric Administrations. March 2000 - August 31, 2004.

Professional Accomplishments/Duties

Polar Observations and Processes Research Group, December 2010 - present

Summary: The scientific objective of Polar Observations and Processes Research group is to understand underlying mechanism of arctic climate by detailed atmospheric observations. The group maintains instruments in Alert and Eureka/Nunavut/Canada and Barrow/Alaska. The recent initiative to establish an international arctic observatory in Tiksi Russia is an important part of US-Russia relationship (<http://www.state.gov/p/eur/ci/rs/usrussiabilat/143509.htm>). The group is also expanding its operation in Summit/Greenland. With this rapid expansion, I am responsible for coordinating with PSD IT group, PSD3 scientists and Global Monitoring Division/ESRL/NOAA technicians and oversee the data operation.

- Arctic Climate Information System/Data management, PSD3/ESRL/NOAA, December 2009 - present. Streamlining the data flow in the polar observations and processes research group. This includes planning on computer/network hardware purchase, establishing instrument documentation, QC procedures, and instrument calibration routines, then ultimately providing data services through web server.
- International Arctic Systems for Observing the Atmosphere, PSD3/ESRL/NOAA, December 2009 - present.

International Arctic Systems for Observing the Atmosphere (IASOA) consists of network of nine arctic observatories to monitor arctic climate change. It is a collaborative effort with Canadian Network for the Detection of Atmospheric Change (CANDAC). Its web site iasoa.org promotes arctic data portal: “observatories at a glance”. Participating in improving “observatories at a glance” matrix. Processed pressure, temperature and dew point temperature data for the iasoa observatories from the NCDC Integrated Surface Hourly Global data and made them available through iasoa.org.

- QC RAD radiation instrument quality control for Arctic sites, PSD3/ESRL/NOAA. April 2010 – present. With collaboration with Global Monitoring Division/NOAA, Pacific Northwest National Laboratory/Atmospheric Radiation Measurement (ARM)/Department of Energy and Environment Canada, adapting QC RAD surface solar radiation instrument quality control by Chuck Long (PNNL) to the Eureka (Nunavut, Canada) flux tower solar radiation instruments.

- PSD Data Group Arctic page, PSD3/ESRL/NOAA. May 2010 – present. PSD data group provides various climate data through its web site (<http://www.esrl.noaa.gov/psd/data/>). With collaboration with PSD data group, developing web visualization tools to plot model data (global scale climate reanalysis data) in arctic and IASAO station observations. Created research pages for the PSD arctic group page (<http://www.esrl.noaa.gov/psd/arctic/>). Supervised a summer student intern to aid this effort.

- Arctic group wiki page, PSD3/ESRL/NOAA, December 2009 - present. Archiving information on data operation and Black Carbon research in the polar processes and observations group on wiki.

- Arctic Surface Radiation Data and Instrument database project, PSD3/ESRL/NOAA, December 2010 - present. Am designing a database for instrument (BSRN standard compliant radiometers) deployment, calibration, and data in arctic.

- Research: aerosol and cloud classifier with lidar and radar, PSD3/ESRL/NOAA, November 2009 - present. Developing a flexible aerosol and cloud profile classifier mask in MATLAB with lidar and radar data in Eureka, Nunavut, Canada to study aerosol-cloud interactions.

- Research: a possible influence of black carbon on arctic climate, PSD3/ESRL/NOAA, November 2009 - present. Designing a research project to study a possible influence of black carbon on cloud formation/climate in arctic, using both chemical and physical measurements and backtrajectory model.

Climate Dynamics Research Group/PSD1/ESRL/NOAA, November 2004 – November 2009

Summary: The 20th Century Reanalysis dataset version 1 (1908-1958) and version 2 (1871-present)

(http://www.esrl.noaa.gov/psd/data/20thC_Rean/) are the largest comprehensive global climate dataset that the Physical Science Division ever produced, well surpassing the similar de facto standard global climate dataset in the atmospheric science field, NCEP-NCAR reanalysis dataset (1948-present). The complete dataset is well over 4 terabytes. With this long-term dataset, atmospheric scientists will be able to investigate important climate events such as Dust Bowl drought in 1930s, El Niño and most importantly, climate change. A brief description of the project is available in the FY 2009 Report to Congress on the Implementation of The E-Government Act of 2002 (2010) by the Office of Management and Budget. High Speed Computing Resources were provided by National Energy Research Scientific Computing Center. The project required a person with in depth knowledge in Information System Management as well as Science. I was responsible for the data management and the application development of this project. I was the only full-time staff besides one full-time Primary Investigator for this project.

- 20th Century Reanalysis Project, PSD1/ESRL/NOAA, November 2004 - November 2009.

Took part in producing version 1 (1907-1958) and version 2 (1891-present) reanalysis products by streamlining and running the data assimilation systems, implementing utility programs, conducting diagnostics, designing/creating input data files in HDF5 binary file format, and maintaining project management blog and documentations. Conducted preliminary research in MJO and Dust Bowls drought, using the dataset.

- International Surface Pressure Data Bank (ISPD) Project, PSD1/ESRL/NOAA and NCDC/NOAA, November 2004 - November 2009.

The International Surface Pressure Data Bank Project is a World Meteorological Organization (WMO)/Global Climate Observation System (GCOS)/Surface Pressure Working group initiative. The dataset starts from 1768 and it is a result

of international collaboration of many scientists all over the world. This dataset was used as input observations to the 20th Century Reanalysis data assimilation system.

Participated in creating the comprehensive surface pressure dataset by providing software/data Quality Control/document support. Ingested various data sets such as Byrd arctic data, Canadian arctic data, and 1925 Tri-state tornado data.

- International Surface Pressure Data Bank (ISPDB) HDF5 Project, PSD1/ESRL/NOAA and NCDC/NOAA, November 2004 - November 2009.

Multi dimensional nature of the ISPDB dataset prompted the GCOS/Surface Pressure Working group recommended the use of HDF5 binary file format. Innovative ISPDB HDF5 file design incorporates relational database concept to accommodate various data field such as original observation, geophysical location, data correction method, assimilation feedback, and data center information.

Designed the entire structure of the ISPDB HDF5 file format and programmed APIs for it.

- “Derived” tropical cyclone pressure dataset for historical reanalysis project (parametric modeling and error estimates), PSD1/ESRL/NOAA, 2008.

Many early tropical cyclone pressure data are wind speed only observations. Evaluated three wind speed/pressure approximation methods and synthesized “derived” pressure dataset (1849-present) from wind speeds based on the National Climatic Data Center/NOAA TC Best Track Archive for Climate Stewardship (IBTrACS) dataset. Estimated modeling errors by jackknife bootstrapping and Monte Carlo assimilations. The original and derived datasets were inserted into the MySQL database system. The synthesized TC data has been assimilated in the 20th Century Reanalysis version 2.

- PSD2 Data Catalogue Database Project, PSD2/ESRL/NOAA, 2005.

Physical Science Division 2 has many datasets from various instruments and this gives rise to the data cataloging needs.

Designed PSD2 data catalogue database in MySQL format.

Surface Radiation Research Branch/NOAA (Radiation Group/Global Monitoring Division/ESRL/NOAA), March 2000 – October 2004.

Summary: The Surface Radiation Research Branch (now GMD G-Rad group) monitors infrared, visible, and Ultra Violet surface radiations in the continental United States since 1993. It is the only laboratory in the United States who has the long-term solar surface radiation monitoring records. I worked for this group as a student intern as well as a professional research assistant. I contributed to the group by 1. Designing and programming the instrument deployment/calibration database system in Postgres database, and 2. Customizing the Linux computers for the TSI SkyImager instrument.

- Central UV Calibration Facility Instrument Database Project, CUCF/GMD/NOAA, September 2004 - October 2004. CUCF Facility provides highly accurate and long-term calibration services of UV instruments.

Implemented a web interface/database in Postgres/PHP for CUCF Calibration Facility UV Radiation Instrument Calibration routines.

- SURFRAD/ARM Network Instrument Database Project, SRRB/GMD/NOAA, 2004.

Radiation instruments for SURFRAD and ARM programs go through periodical calibration and deployment cycles.

Implemented SURFRAD/ARM Network Visible Radiation Instrument web interface/database in Postgres/PHP to keep track of this instrument cycle.

- Linux-TSI SkyImager Project, SRRB/GMD/NOAA, from 2000 - 2004.

TSI SkyImager provides cloud fraction information from 360-degree sky images. It provides important information on surface radiation budget and regional and global modeling. The original software for this instrument was written in Java on Microsoft Windows.

Customized Linux OS for the TSI SkyImager. The package is being deployed in the SURFRAD network.

Publications

Refereed Paper

- Matsui, N., Halliwell, D., and Uttal, T., Radiation measurements in arctic: in preparation, Atmospheric measurement techniques.
- Matsui, N. and Hartten, L. M., Deriving Tropical Cyclone Central Pressures data for Reanalyses: estimating errors: in preparation, Monthly Weather Review.
- Matsui, N., Compo, G. P., and Hartten, L. M., Deriving Tropical Cyclone Central Pressures data for Reanalyses: submitted, Monthly Weather Review, 2010.
- Compo, G.P., J.S. Whitaker, P.D. Sardeshmukh, N. Matsui, R.J. Allan, X. Yin, B.E. Gleason, R.S. Vose, G. Rutledge, P. Bessemoulin, S. Brönnimann, M. Brunet, R.I. Crouthamel, A.N. Grant, P.Y. Groisman, P.D. Jones, M. Kruk, A.C. Kruger, G.J. Marshall, M. Maugeri, H.Y. Mok, Ø. Nordli, T.F. Ross, R.M. Trigo, X.L. Wang, S.D. Woodruff, S.J. Worley, Compo, 20th Century Reanalyses: Quarterly Journal of the Royal Meteorological Society, 2011, 137, 1-28. DOI: 10.1002/qj.776 (<http://www.wiley.com/WileyCDA/PressRelease/pressReleaseId-90037.html>).
- Compo, G.P. et al, The International Surface Pressure Databank: in preparation, BAMS.

Conference Presentation

- Matsui, N., Long C., Niebergall, O., McArthur, B., Halliwell, D., Longenecker, D., Augustine, J., and Uttal, T.: Quality control of the Eureka flux tower radiation measurements by QCRad (progress report): power point presentation, CANDAC workshop, Halifax, Nova Scotia, Nov 2, 2010.

Technical Report/document

- Yin, X., B.E. Gleason, G. P. Compo, N. Matsui, R. S. Vose, “The International Surface Pressure Databank (ISPD) land component, version 2.2”: National Climatic Data Center, Asheville, NC, pp.1-12, 2008.
- Matsui N. and G. P. Compo, “The International Surface Pressure Databank HDF5 observation files“: PSD/ESRL/NOAA.

Courses/Training

- NCL training session, November 2005.
- IDL training session, November 2007.
- Atmospheric Chemistry (kinetics), CIRES summer lecture series by Dr. Michael Pilling, Jun 2009.
- Hysplit back trajectory model training session, GMD/NOAA, July 2009.

Conference

- Arctic Observing Network PI meeting, Boulder, CO, Nov. 30-Dec. 2, 2009.
 - State of the Arctic, Miami, FL, March 16-19, 2010.
-

Community Service

PSD Work Advisory Committee (WAC) member, from 2004 to present.
