

TECHNOLOGIES USED FOR CUSTOMIZED DYNAMIC WEB ACCESS TO A UNIQUE COLLECTION OF ARCTIC CHANGE TIME SERIES

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1. INTRODUCTION

The Unaami Data Collection (Soreide *et al.*, 2002) was assembled to help scientists and researchers to study and understand the recent atmospheric, oceanic, and terrestrial changes in the Arctic. The Unaami Data Collection consists diverse set of time series including fisheries, biology, terrestrial, sea ice, atmosphere, ocean, and climate index data. A special Web site has been built (Fig. 1) to provide easy access to the Unaami Data Collection. This paper describes the technologies implemented in creating the Unaami Data Collection web access system and back-end time series data management.

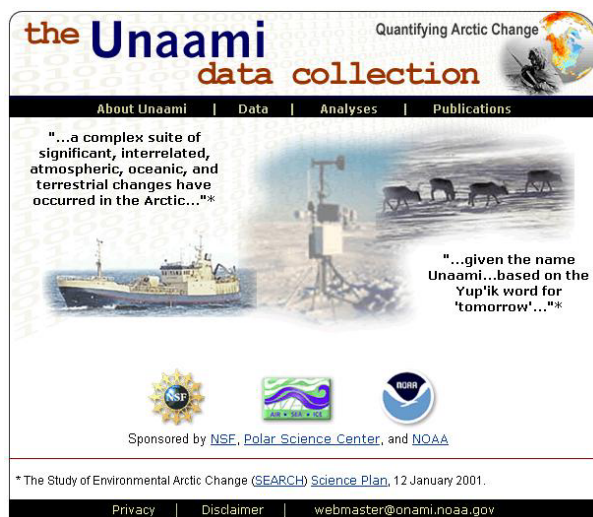


Figure 1. The Unaami Data Collection Web site

2. DATA MANGEMENT

The original datasets are from various sources and in different formats. These data are carefully chosen to form a unique collection of time series data that are representative of changes in the Arctic since 1970. Data are quality controlled and converted into netCDF format following the standard EPIC netCDF conventions for in-situ data. The dataset information including data source, reference, units, contact, etc. are stored in the netCDF

file. Data files are categorized into these groups based on their types: fisheries, biology, terrestrial, sea ice, atmosphere, ocean, and climate indices. The EPIC/MySQL database (Zhu and Denbo, 2001) is used to manage the meta-data. This makes it easier to utilize exiting EPIC software for data loading and retrieving. Currently, there are more than 70 datasets are collected and more will be added later.

3. DATA ACCESS VIA WEB

A special Web site ("The Unaami Data Collection, Quantifying Arctic Change") is established to provide information and easy access to this unique time series data collection.

3.1 Data Selection

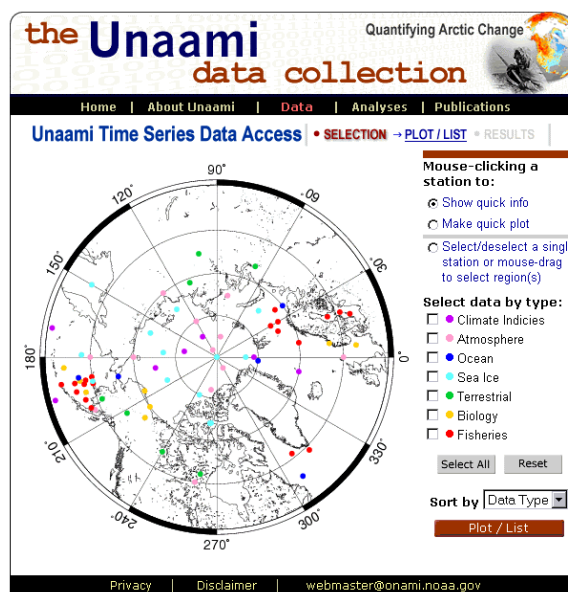


Figure 2. Unaami Data Collection access page

The Unaami Data Collection access web interface (Fig. 2) contains a map of northern polar region showing geographic coverage of the multi-disciplinary Unaami Data Collection. The colors of the data station on the map represent different data types. User can select/deselect individual data point by clicking the station on the map, select a region by mouse-dragging on the map, or select/de-select a group of datasets that have the same type by checking/un-checking "Select data by type" boxes.

From this page, user can make a quick plot, view quick information of an individual dataset (Fig. 3) or

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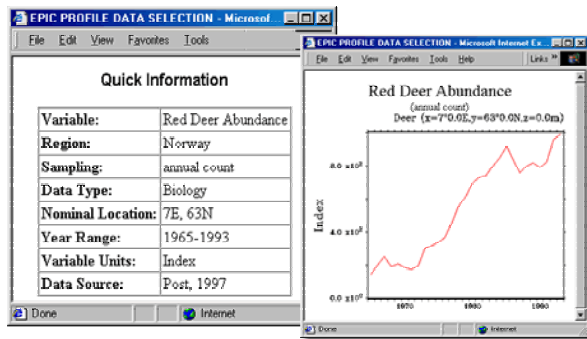


Figure 4. Example of Quick Information and Plot

request for further data plotting, listing or downloading by clicking the "Plot/List" button.

3.2 Data Plotting, Listing, and Downloading

Fig. 4 shows the data plotting, listing and downloading option page. It lists the time series user selected. User can sort selected time series by data type, region, start year, latitude, or longitude. User can also refine the selection from this page.

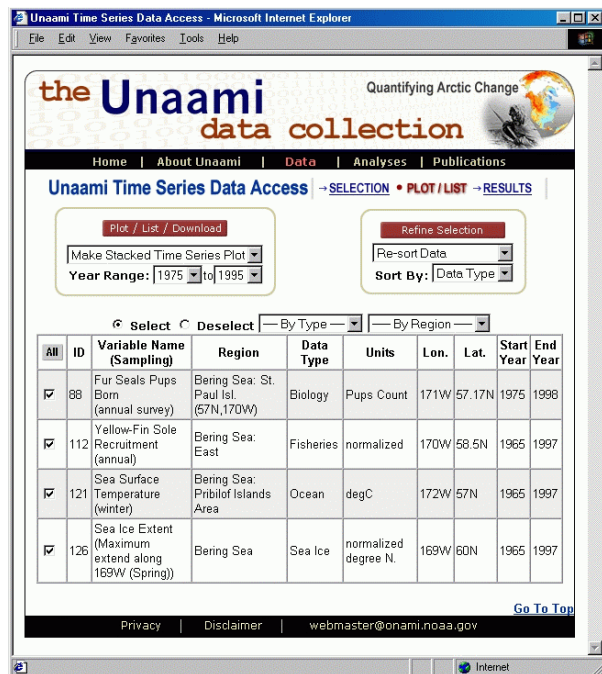


Figure 3. Data Plotting, Listing and Downloading

This page provides following options for data access:

- Make stacked time series plot (Fig. 5)
- Make single time series plot
- View detailed data information
- Display data in ASCII format
- Download data in netCDF form

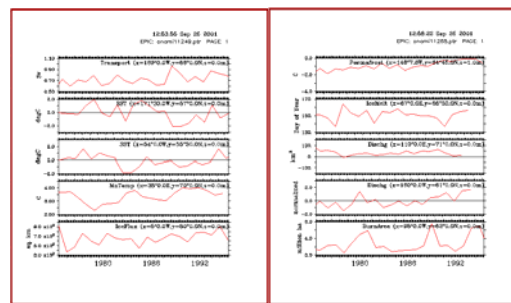


Figure 5. Example of Stacked Time Series Plots

4. WEB TECHNOLOGIES

In the Unaami Data Collection web access system, the Java Applet and JavaScript are implemented to provide highly user interactive front-end data selection features. The JavaScript and back-end CGI scripts are used to generate the result pages dynamically on-the-fly. Existing EPIC system utilities and the PPLUS graphic package are used to perform back-end data retrieving, data plotting, and data listing.

5. Summary

The Unaami Data Collection web access system provides easy access to a unique collection of time series data that are representative of changes in the Arctic since 1970. The Unaami Data Collection will be expanded to include new time series as they are discovered. If you know of any time series that represents any aspect of the Arctic change, please contact use: James E. Overland, NOAA/Pacific Marine Environmental Laboratory, 7600 Sand Pointer Way NE, Seattle, WA 98115, Phone: 206-526-6795; Email: James.E.Overland@noaa.gov.

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7. References

Soreide, N.N., J.E. Overland, W.H. Zhu, and P. Sullivan, 2002: The Unaami Data Collection: Web Access to Time Series Quantifying Arctic Change. 18th International Conference on Interactive Information and Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology AMS, 13-17 January 2002, Orlando, FL.