Integrating Gridded NASA Hydrological Data into CUAHSI HIS

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Abstract: NASA's hydrologic data are widely used in climate modeling and water resources management. The CUAHSI Hydrologic Information System (HIS) was developed to provide a web-based interface for accessing and interacting with hydrologic data. In this paper, we describe efforts to integrate NASA's hydrologic data into CUAHSI HIS to enhance the HIS's capability to support integrated hydrologic studies. The work includes developing web services to access NASA data, using GRADS to render the data in a web browser, and using CUAHSI HIS to display the data. The results demonstrate the potential of CUAHSI HIS to be an effective platform for integrating and delivering hydrologic data from various sources.

Keywords: NASA hydrologic data, CUAHSI HIS, web services, GRADS, hydrologic modeling.

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1. Introduction

The amount of hydrological data available from NASA remote sensing and modeling systems is vast and ever-growing. But, until recently, these data were mostly available only through command-line web services. This is beginning to change with the integration of NASA data into CUAHSI HIS, a web-based hydrologic information system. The HIS provides a web interface for accessing and interacting with hydrologic data. By integrating NASA data, we can enhance the HIS's capability to support integrated hydrologic studies.

2. Hydrological Data at HDISC NASA

NASA has developed a variety of hydrologic data products, including gridded hourly and daily precipitation, temperature, and soil moisture data. These data are available through the NASA Hydrology Data Information Service (HDISC) at various locations, including the NASA Earth Science Data and Information Services Center (DISC) located at Goddard Space Flight Center in Greenbelt, MD. The DISC provides access to a variety of NASA hydrologic data products, including those from the NASA Land Data Assimilation System (NLDAS) and the Global Land Data Assimilation System (GLDAS).

3. Bridging the Gap ("Digital Divide")

Bridging the gap between access to NASA data and end user communities is a major challenge. This gap is often referred to as the "digital divide." The HIS can help to bridge this gap by providing a web-based interface for accessing and interacting with hydrologic data. By integrating NASA data into CUAHSI HIS, we can enhance the HIS's capability to support integrated hydrologic studies.

4. Integrating NASA Hydrological Data into CUAHSI HIS

Integrating NASA hydrologic data into CUAHSI HIS involves several steps. First, we need to develop web services to access NASA data. Then, we can use GRADS to render the data in a web browser. Finally, we can use CUAHSI HIS to display the data. The results demonstrate the potential of CUAHSI HIS to be an effective platform for integrating and delivering hydrologic data from various sources.

5. Conclusions

In conclusion, the integration of NASA hydrologic data into CUAHSI HIS demonstrates the potential of web-based interfaces for accessing and interacting with hydrologic data. By bridging the gap between access to NASA data and end user communities, we can enhance the HIS's capability to support integrated hydrologic studies. Future work will focus on improving the web services and rendering capabilities to provide a more interactive and user-friendly experience.

References


Figure 1. Schematic of HIS architecture.

Figure 2. Web-based data services for NASA data is a key component of the HIS.

Figure 3. Example of data visualization using GRADS.

Figure 4. Time series of NASA hydrologic data.

Figure 5. Example of data visualization using CUAHSI HIS.

Future Improvement

With the new capability to access and visualize NASA hydrologic data, we can further improve the HIS's functionality. Future work will focus on improving the web services and rendering capabilities to provide a more interactive and user-friendly experience. We will also explore ways to integrate other hydrologic data sources into CUAHSI HIS to provide a comprehensive view of the hydrologic system.