

# GCIP (GEWEX Continental-scale International Project)

## FY 2000 Information Sheet

GCIP (GEWEX Continental-scale International Project) is a multi-year interdisciplinary initiative that is jointly funded by NOAA and NASA. Its long term mission is to develop and demonstrate a capability to predict changes in water resources on time scales up to seasonal and annual as an integral part of a climate prediction system. In the next few years GCIP plans to transition to the GEWEX America Prediction Project (GAPP). However, before taking that step it is very important to fulfill plans for studying the northwestern part of the Mississippi River Basin. This call is designed to accelerate progress towards that goal. In particular, it gives emphasis to studies making effective use of remote and in-situ data sets and model outputs, and to data set development work that will contribute to GCIP's legacy. Questions regarding this call should be directed to Rick Lawford (lawford@ogp.noaa.gov) at NOAA (Please note, during July questions for NOAA should be directed to John Leese at leese@ogp.noaa.gov ) or Dr. Eric Wood (ewood@hq.nasa.gov) at NASA. Consistent with the GCIP program mission and objectives, projects are encouraged that address: 1) energy and water budgets on regional scales, 2) coupled model development and validation, 3) validation and applications of data assimilation products, 4) the potential uses of climate predictions in water resource applications, and 5) process studies and essential data sets. The geographical focus for these studies is the Mississippi River Basin. Details on the plans for implementing GCIP during the period of this call are detailed in the Major Activities Plan for the LSA-Northwest). This document is available at [http://www.joss.ucar.edu/gcip/map\\_99\\_lsa\\_nw/toc.html](http://www.joss.ucar.edu/gcip/map_99_lsa_nw/toc.html) or by contacting the GCIP Project Office ([calhoun@ogp.noaa.gov](mailto:calhoun@ogp.noaa.gov)).

1. **RESEARCH PRIORITIES IN THE LSA-NORTHWEST** The GCIP LSA-Northwest encompasses the Missouri River Basin. It is characterized by large year-to-year variability in the water cycle, major orographic features, unique landscape features such as the Nebraska Sand Hills and significant flow regulation. Projects in the LSA-Northwest are intended to help address the region's research hypothesis: "Land-atmosphere interactions and terrain effects can be modeled with sufficient skill to provide useful predictions for hydrologic applications on daily to seasonal time scales."

Proposals directed toward GCIP activities in the LSA-Northwest should address one or more of the following priorities:

**Land surface and hydrologic characteristics:** The goal for this research area is to evolve a static and coarse resolution representations of land surface and hydrologic characteristics to a more detailed and dynamic landscape characterized by a strong annual cycle with significant spatial and temporal variability. Specific needs relate to incorporating spatially heterogeneous and temporally variable vegetation and snow cover conditions into the land surface and hydrologic components of GCIP

models; ensuring that unique LSA-NW landscape conditions (e.g. orography, groundwater recharge areas, etc.) are properly included in GCIP's understanding of land-atmosphere processes, and developing procedures for areal flux estimates for the region.

**Coupled hydrologic/ atmospheric modeling:** This research is intended to diagnose and improve the representation of significant regional effects of land/atmosphere interactions on the hydroclimatology of the Missouri River Basin on spatial and temporal scales relevant for hydrologic applications and water resource management. This work will include studies of processes such as orographic precipitation, groundwater, cold season precipitation and hydrology; development of the land surface and hydrologic components of coupled models; model applications to the role of orographic and other land surface features; and model validation studies.

**Hydrometeorological Prediction and Water Resources:** To enhance the reliability of precipitation, streamflow and related hydrologic variables that impact the water supply and demand forecasts for water managers in temporal scales up to seasonal. Studies are solicited that will improve the application of coupled model results to hydrologic forecasting, contribute to the further development of hydrologic models, and improve the representation of high resolution precipitation fields in complex terrain.

## 2. **APPLICATIONS OF REMOTE SENSING DATA AND NASA RELEVANCE**

GCIP is seeking to strengthen its ability to use remote sensing data and to apply the relationships developed in the Mississippi River Basin globally.

Remote sensing is particularly useful in describing the spatial distribution of land surface cover and other surface conditions, for estimating radiant fluxes through the atmosphere and at the land surface, and for estimating other atmospheric and surface variables. These attributes of remote sensing data are very valuable for continental scale energy and water budget studies, consequently GCIP would like to take full advantage of their potential. GCIP is also interested in the development and testing of new algorithms that will more effectively translate the measured radiance from existing and planned satellites into parameters that are needed for climate models. Through the development of improved data assimilation systems these data will be integrated with conventional data and provide the most accurate fields of critical parameters for land based process studies. Proposals are solicited to develop and validate algorithms; to develop and test data assimilation products, and to carry out studies using these data to develop new insights into the land atmosphere interactions and hydrological features of the Mississippi River Basin.

Approximately 50% of the funds available for this call are being provided by NASA. To be considered for NASA funding, proposals should have a separate section that describes the relevance of the proposed research to NASA priorities, including remote sensing and/or NASA activities such as programs of the Data Assimilation Office <http://dao.gsfc.nasa.gov> and the Seasonal to Interannual Prediction Program <http://nsipp.gsfc.nasa.gov>. Proposals will be assigned to NOAA or NASA funding depending on their apparent relevance to the goals and programs of the respective agencies. Proposals lacking a section on NASA relevance will not be considered for NASA funding; proposals containing such a section will be considered for funding by either agency.

### **3. DATA SET AND DATA ASSIMILATION SYSTEM DEVELOPMENT**

GCIP encourages the use of its data sets for model development and process studies. Three special data sets were prepared during the build up period of GCIP prior to October 1995 and are available on CD-ROMs through the Project Office. Regional model output data are available through NCAR from the NOAA/NCEP Eta operational model, the Mesoscale Analysis and Prediction System (MAPS) experimental model operated by the NOAA Forecast Systems Laboratory and the Global Environmental Multiscale (GEM) operational model run at the Canadian Meteorological Center. Satellite remote sensing data including special GCIP cloud and radiation data products are also available through the GCIP data management system. A hard copy of this summary report on GCIP data availability can be ordered from <leese@ogp.noaa.gov>

### **4. TRANSITION TO THE GEWEX AMERICA PREDICTION PROJECT (GAPP)**

The GCIP Program will be transitioning in the next few years to the GEWEX America Prediction Project (GAPP). This new project will extend the research that GCIP has been carrying out in the Mississippi River Basin to include most of the USA. It will also enable the project to include more predictive studies and hence more rapidly address the overall strategic mission for GCIP. A few new projects that will develop the heritage of the GCIP project and seed the development of the GAPP program are solicited. In particular, proposals are encouraged that will bring GCIP data set development to a conclusion through suitable data archives and analyses. In addition, studies that support two components of the new GAPP initiative are also encouraged. These new elements include land memory studies and the Coordinated Enhanced Observing Period.

Proposals that address two elements of GAPP will be considered provided they are within the domain of the Mississippi River Basin. These elements include land surface memory processes and the Coordinated Enhanced Observing Period. Land Memory Process Research includes studies of the effects of land surface features on the prediction of climate with the one to three month lead times. The land surface properties that are felt to be most critical include soil moisture anomalies,

vegetation, snow cover, arid region processes and orographic influences. The Coordinated Enhanced Observing Period (CEOP) which is planned for the period 2001 to 2002 will have requirements for observations and analyses over the GCIP domain. These data sets will support the documentation of the role of land as a heat source or sink as it influences the large scale circulation patterns and contribute to model validation and transferability studies

- 1) **INFORMATION FOR PROPOSERS** "All proposers, whether they wish to be considered for NOAA or NASA funding (or both), should respond using the NOAA/OGP guidelines, obtainable under <http://www.ogp.noaa.gov/grants/2000/index.htm>. Letters of intent are due on July 30, 1999. Note that this NOAA/NASA GCIP Call for Proposals constitutes a "joint announcement" under the terms of the NOAA/OGP call, and therefore a Letter of Intent is encouraged but not mandatory. Full proposals must be received at OGP no later than **October 15, 1999**. This is a strict deadline."