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**HYDROLOGIC SCIENCE at the NATIONAL SCIENCE FOUNDATION  
L. Douglas James – October 18, 2007**

Hierarchy - NSF/GEO/EAR/HS

Program Structure – Five Components

1. Core Programs
2. Science and Technology Centers
3. Cross Program Interfacing
4. Special Competitions
5. Consortia - CUAHSI

Funds universities primarily

Allows supplemental funding for collaborating Federal agencies

Money cannot go to support salaries of Federal employees

Core Program – Support for fundamental research on hydrologic processes.

For Hydrology, average proposal is for \$100k/yr

Example Topics

Partitioning and tracking direct runoff

- Interaction with soil moisture storage.
- Scaling hillslope processes (role of macropores).
- Distributed modeling associated with variable source areas.
- Integration between runoff and atmospheric models.
- Flow through channel alluvium

Groundwater fluxes and transport

- Recharge locations and timings
- Movements of pollution plumes, heterogeneous aquifers
- Transport of colloids with associated pollutants
- Scientific support to enable groundwater remediation

Erosion and sedimentation

- Natural channel scour and deposition.
- Sediment transport by hydrologic events.
- Interactions between vegetation and channel flow

Aquatic Biogeochemistry

- Biogeochemical processes in streams, lakes, & aquifers
- Roles of water-element interactions in chemical cycling

Evapotranspiration

- Interaction between vegetation and soil moisture
- Integrating over a heterogeneous land surface.

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Science and Technology Centers – average of \$4m/yr for 10 years  
Competition about once every three years

SAHRA – Univ. of Arizona – Hydrology in Semi-Arid Lands  
Salinity loading along rivers  
Water extractions by xerophytes and phreatophytes  
NCED – Univ. of Minnesota – Earth Surface Dynamics  
Reshaping of lands and stream channels through time  
Preservation of riverine resources

Cross Program Interfacing – shared funding for core proposals

Hydrology regularly shares with:  
Environmental Biology  
Geomorphology  
Geochemistry  
Geography – GIS  
Climate and Meteorology

Special Competitions

Occasional Announcements – Watch NSF Web Page  
Coupled Carbon and Water Cycles  
Geo-Mathematics  
Environmental Geochemistry and Biogeochemistry  
Water and Watersheds  
Occasional “Dear Colleague” Letters  
- Describe opportunities to use current announcements.  
- Current letter describes supplemental GEO funding of shared proposals.

CUAHSI – Consortium of Universities for Advancement of Hydrologic Science  
An incorporated organization of over 100 member universities.

Visionary Dominant Objective  
WATERS Network – Instrumented field sites to support research  
in Hydrology and Environmental Engineering  
Watersheds in the order of 50,000 km sq  
Inter-Agency Cooperation Essential  
Operation and Maintenance  
Field Technical Personnel

On-Going Supporting Activities  
Observatory Test Beds – Field testing of design issues  
Critical Zone Observatories – Larger scale field testing  
Hydrologic Information System – David Maidment  
Hydrology Measurement Facility – John Selker

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Applications of Geophysics in Hydrology – Rosemary Knight  
Synthesis Activities – M. Sivapalan & C. Vorosmarthy

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