The National Center for Hydrologic Synthesis (NCHS)

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Background

CUAHSI identified the need for a Synthesis Center that will:

Promote the creation of a vision for the future of hydrologic science;

Cultivate an interdisciplinary research culture;

Offer new opportunities for cross-disciplinary research;

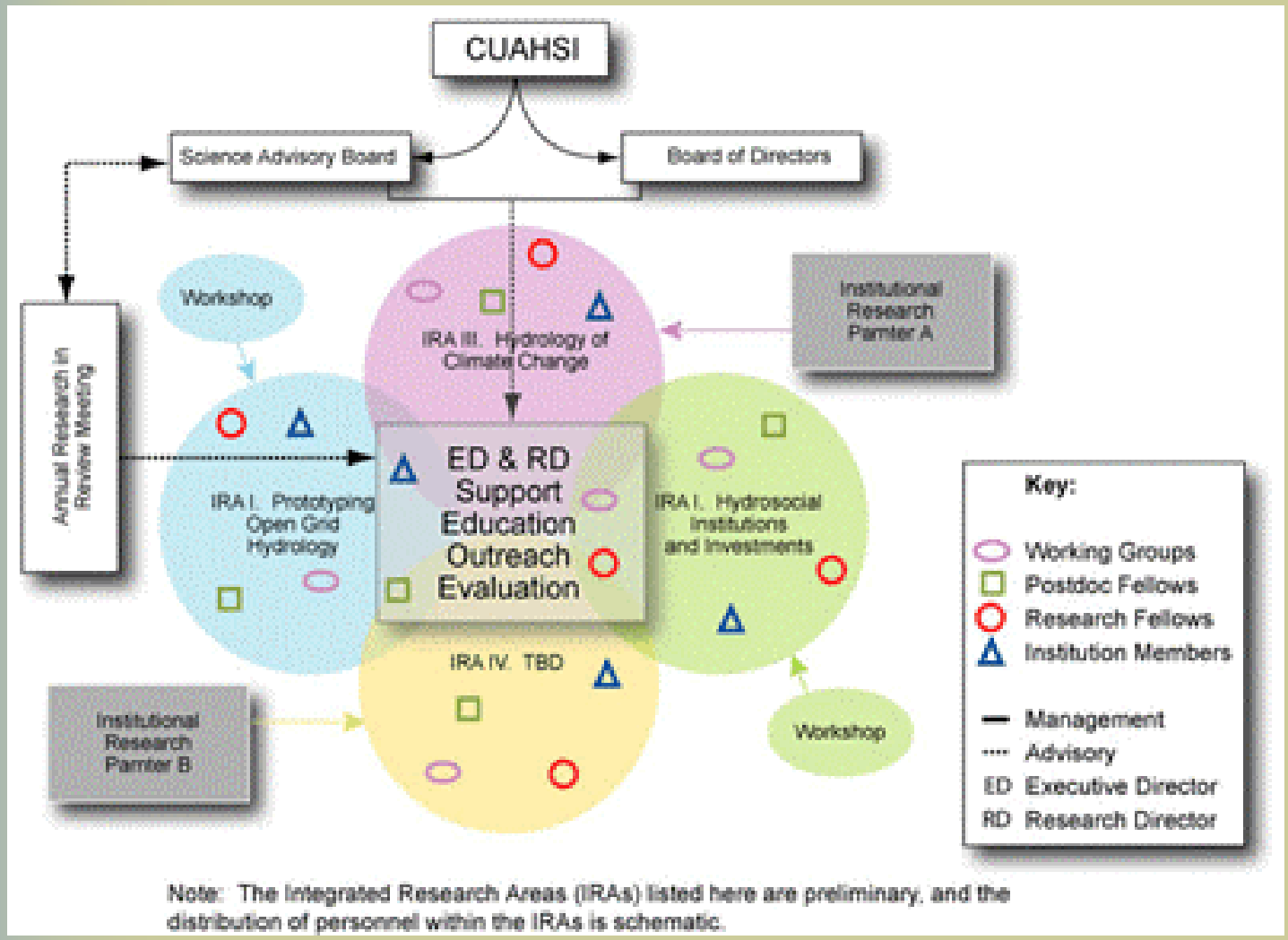
NCHS at Berkeley will be operational 1 November 2005

Executive Director: Yoram Rubin
Director of Operations: Susan Hubbard

Requirements

- **Data Access** – develop and test new theories and models; through long-term observatories and data bases, including new data via the GEOSS;
- **Interdisciplinarity** –Interdisciplinary research teams, with participation from the earth, life, atmospheric/climate, and social sciences and from engineering;
- **Collaboration and partnerships –**hydrologists will need to form unconventional and nontraditional research coalitions, with environmental leaders, policy experts, public and private sectors hydrology stakeholders and end users;
- **Knowledge discovery platform** – including advanced computing and visualization; sensors, wireless and IT expertise, open grid computing and interoperability;

Organizational Design

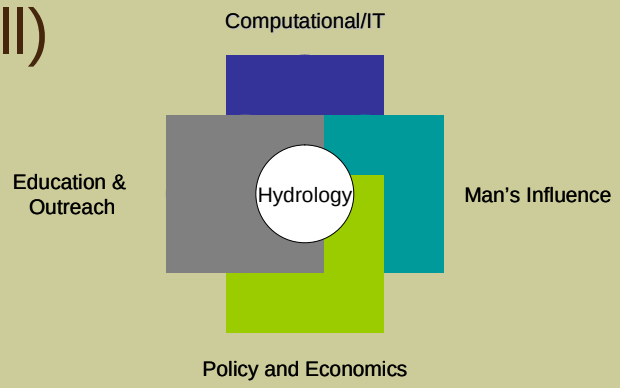


Integrated Research Areas (IRAs)

- IRAs are the **main vehicle** for facilitating cross-disciplinary research;
- IRAs will represent arenas of inquiry in which **cross-cutting collaborations** are likely to produce significant progress, and reflect the needs and interests of the **hydrology community at large**,
- IRAs will be **selected, assessed and eventually terminated by the Center's Scientific Advisory Board** (SAB), based on their significance and potential for promoting the Center's vision and strategic plan, with input from CUAHSI and the hydrology community (workshops, annual mtgs);
- Provide broad outlines rather than narrow definitions for the Center's work;

Working Groups

- Observatories (Lead: George Hornberger)
- Advanced Instrumentation (Lead: Witold Krajewski)
- Computational Hydrology, Assimilation, and Infrastructure (Lead: Norman Miller)
- Global Water Cycle (Charlie Vorosmarty)
- Hydrologically Compatible Institutions (Lead: Henry Vaux)
- Hydrology and Outreach (TBD)
- Hydromorphology (Lead: Upmanu Lall)



Summary of CHAI Objectives

- Develop a infrastructure ramp-up plan;
- Guide the NCHS IT staff as they develop the basic computational infrastructure and train researchers;
- Work with NCHS partners and IT staff to guide the development of the collaboration infrastructure;
- Work with HIS and other data providers to develop a federated view of data sources;
- Assess what software and modeling tools are necessary for performing hydrological synthesis;
- Develop data management and metadata strategy for NCHS to data sources;
- Work with IT staff to choose and test advanced computational capabilities at NCHS;
- Plan a pilot problem using NCHS models, and data from across the grid to address a hydrological question, and document the approach.
- Build the authentication, authorization, and job scheduling infrastructure;
- Build a NCHS access portal which will provide users with access to the center resources.
- Develop web tools and templates for other working groups;

NCHS Partnerships are:

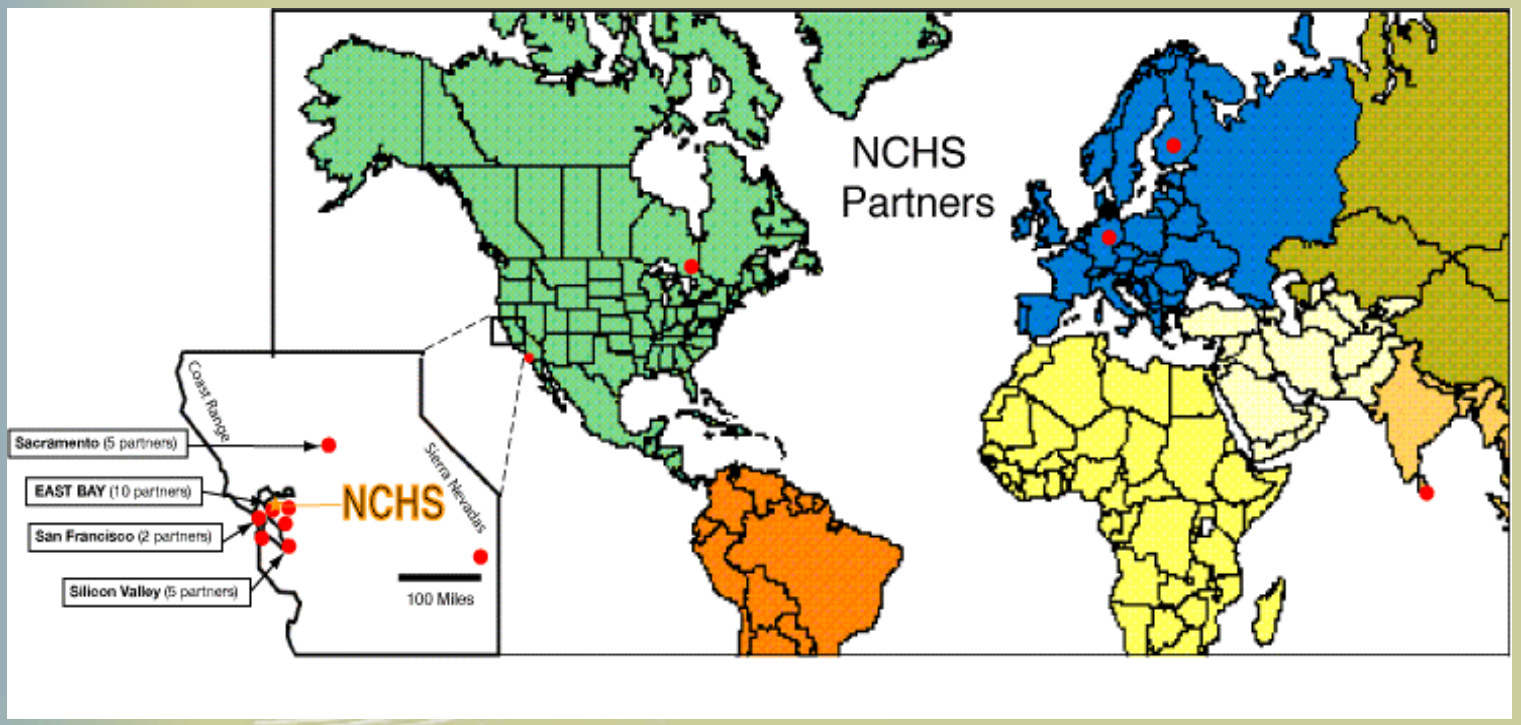
Multi-Sectoral, Multi-disciplinary

International

Committed

We have found in our partners tremendous enthusiasm to participate in the proposed open research platform, which is unconstrained by any agency mandate.

*Thus far, in addition to anticipatory contributions, the NCHS has secured firm support of **$18 Million** from our partners.*



NCHS @ Berkeley Partners

Institutional Members:

- UFZ-Umweltforschungszentrum Leipzig-Halle GmbH
- VTT
- Lawrence Berkeley National Laboratory
- Lawrence Livermore National Laboratory
- LFR Levine Fricke
- Malcolm Pirnie
- UC Berkeley
- U.S.G.S. National Research Program
- U.S.G.S. California Water Program
- Schlumberger
- Bechtel

Institutional Research Partners:

- CALFED
- CA Dept.Water Resources
- Canadian Water Network
- International Water Management Institute
- Pacific Institute
- SwissNex
- U.S. Bureau of Reclamation

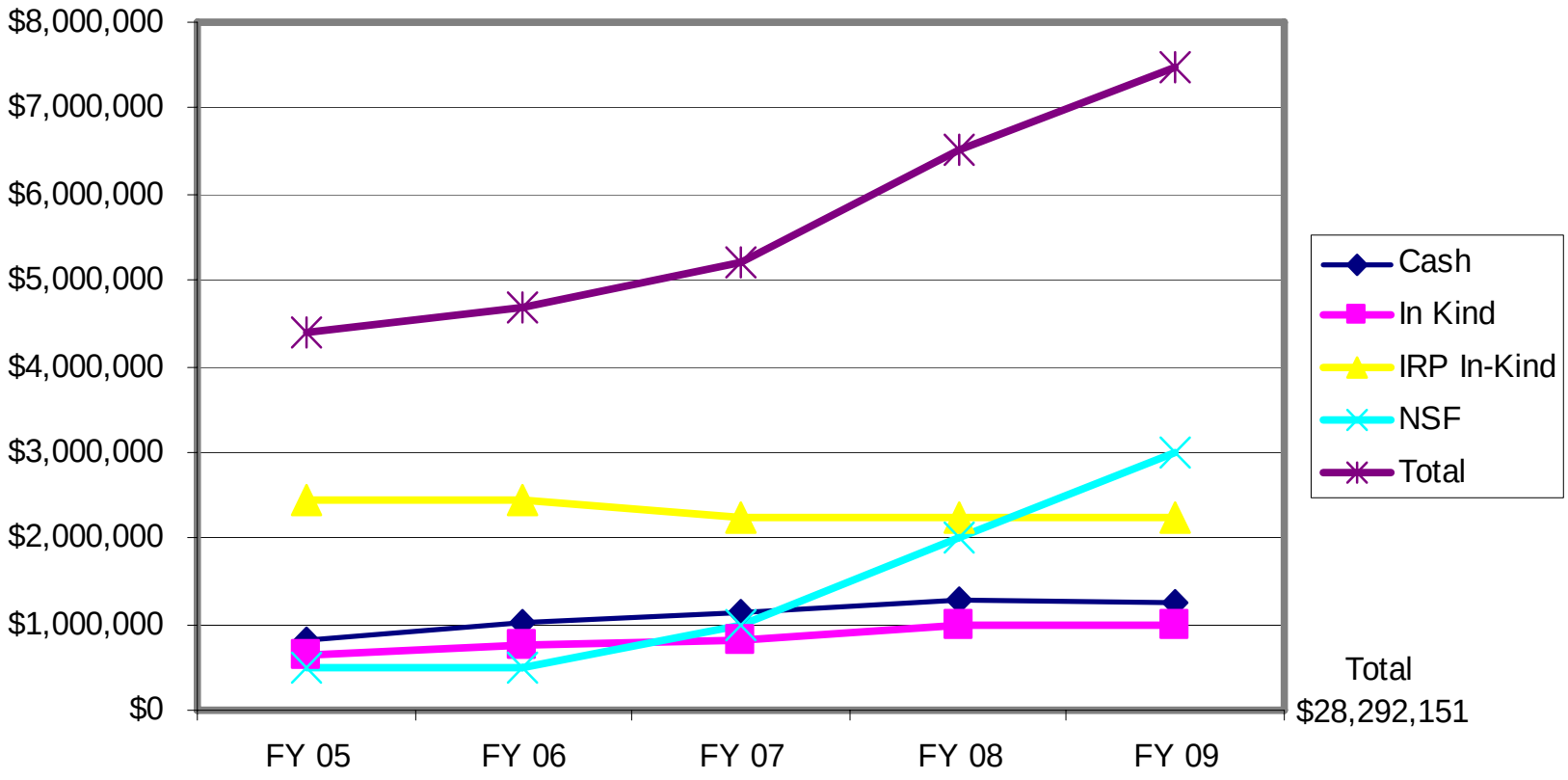
Computational/IT Partners:

- National Energy Research Computing Center (NERSC)
- San Diego Super Computer
- Center for Information Technology Research in the Interest of Society
- GlobeXplorer
- HP
- IBM Almaden
- NASA Ames Research Center
- Microsoft
- Hydrologic Information Systems (HIS)

Education and Outreach Partners:

- Environmental Science Teaching Program
- Exploratorium of San Francisco
- Lawrence Hall of Science
- UC Merced/SNRI
- Water Resources Center Archive

Budget



Yearly Budget: ~$4.3 to 7.4 Million

Five Year NCHS Budget: $ 28 Million

Measures of Success

- Questions to address include: Is the work being done of the highest caliber? Is the research of individual researchers or groups taking advantage of the uniqueness of the Center? Is it interdisciplinary?

- Metrics will be established, based on the level of (or potential for) scientific discovery or innovation, trends in institutional funding, enhancing the richness of the undergraduate or graduate experience, institutional reputation, ability to attract increasing numbers of outstanding researchers, societal relevance of problems being addressed.

- These questions need to be addressed through performance metrics, through surveys, and through internal and external review committees.