DOH/RDM Science Workshop

State of the Hydrology Program

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OHD Director
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Together, we develop and deliver valued science, software and information for river and water resource forecasts to save lives and property, manage water resources, and enhance America's economy

Water Predictions for Life Decisions

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Topics

- *Running the Railroad*
- *Service Enhancements*
- *External Science Interactions*
- *Requirements Based Development Process - HOSIP*
- *Architecture for Service and Science - CHPS*
- *Putting the H in NOAA*

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Running the Railroad

- *Need to maintain focus on existing operational issues*
- *Maintenance of legacy systems*
- *Hot list – bugs*
- *Separate bugs (small effort) from enhancements (large effort)*
- *Provides opportunity to address more bugs each release cycle*
- *Through HSD support*

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Service Enhancements – 3 Themes - examples

- ***Flash Flood Services***
  - FFMP
  - Distributed Hydrologic Modeling
  - HADS
- ***Short- to Long-term Probabilistic Forecasts***
  - Ensemble Modeling
  - Streamflow Regulation Accounting
  - Data Archive Requirements Team
- ***Flood Mapping***
  - Dam Analysis Tools
  - Coastal Storms Initiative – St. Johns River, Florida

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Science Interactions

- ***Universities***
  - NOAA RFP
    - *Distributed modeling*
    - *Ensemble forecasting*
    - *Two dimensional hydrodynamic model*
    - *Ensemble verification*
- ***National Research Council AHPS Review***
  - Multidisciplinary 11 member review panel including
    - *Soroosh Sorooshian (U. of California, Irvine, Chair), George Leavesley (USGS), Dara Entekhabi (MIT), Efi Foufoula-Georgiou (U. of Minnesota), Rick Anthes (UCAR), Glenn Moglen (U. of Maryland), Bill Hooke (AMS)*
  - 2 meetings to date
  - NRC Report in 2005
- ***NWS Water Science Integration Plan***
  - Team members – D.J. Seo, Rob Hartman, Don Cline, Ken Mitchell, Jiayu Zhou

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Requirements based development process

- Hydrologic Operations and Service Improvement Process (HOSIP)

- ***For science and software used in operations***
- ***Identify and agree to what we're going to do***
- ***Structured process to define and document what we're going to do before we do it***
- ***Use documents/requirements throughout the research, development, and maintenance life cycle***
- ***Provide structure that links science enhancements to operational service improvements – support science funding requests***

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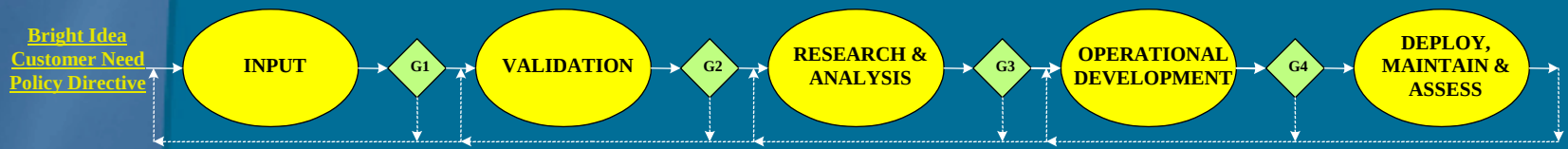
HOSIP Overview

Hydrologic Operations & Service Improvement Process (HOSIP) Stages



INPUT STAGE

- Articulate bright idea & describe basic research or technical approach.

VALIDATION STAGE

- Validate the idea against the mission & budget
- Conceptually describe how the idea would be developed
- Develop the requirements for the new capability
- Develop the business case

RESEARCH & ANALYSIS STAGE

- Conduct Experiments to prove theory
- Update requirements based on experimentation knowledge

OPERATIONAL DEVELOPMENT STAGE

- Design, code & test the new capability
- Perform field testing of the new capability
- Develop capability documentation
- Develop Training Material

DEPLOY, MAINTAIN, & ASSESS STAGE

- Conduct training
- Deploy through AWIPS
- Solicit & assess feedback

- Bright ideas can come from field, OCWWS, lab, or any other valid source of input.
- Field input & review throughout the process

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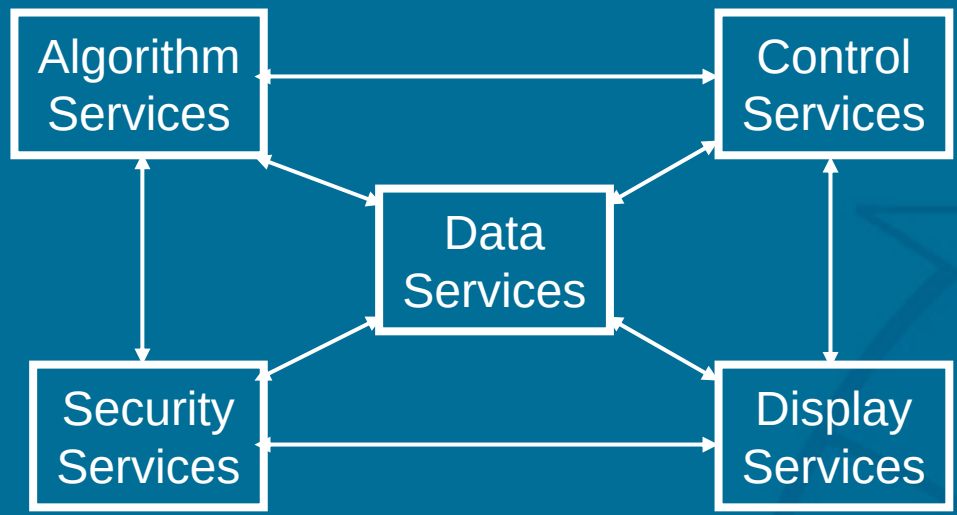
A Service Oriented Architecture (SOA) for Research and Operational Science Infusion

- ***Community Hydrologic Prediction System (CHPS)***
  - For contrast – NWSRFS is a procedural, monolithic architecture
  - SOA delivers functionality (e.g., algorithm, data, display) when requested from a service
  - SOA provides modularity for application linkage and data access

- ***Builds on XML and HTTP standards***
- ***Follow on presentation later in the week***



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Putting the H in NOAA

- *PPBES has provided NOAA level visibility of the Hydrology Program*
- *Tapping resources of OAR, NOS, NESDIS, NCEP to advance hydrologic science*
- *Extramural projects (MOPEX, DMIP, HEPEX, JPOLE, …) and University and other Federal water agency interactions keep Hydrology in sync with scientific advances in water resources prediction and management*

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