NUOPC

NATIONAL UNIFIED OPERATIONAL PREDICTION CAPABILITY

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Growing Needs

- Increasing Risk of Natural Disaster:
  - changing climate manifests itself as weather to the public.
  - better ability to forecast high impact weather has large economic payoff.
  - improved models will provide better seasonal forecasts.
- Increasing Economic Vulnerability and Dependency:
  - transportation – air space management
  - energy management and use
- Need to Exploit the Environment for Military Battlespace Dominance
  - from Tropics to High Arctic

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NUOPC Purpose and Motivation

- The NUOPC partnership exists to ***enable*** an enhanced Global Prediction System
  - Agencies coordinate R&D investments in advanced prediction technology
  - Each Agency leverages the total US investment through aligned policies and procedures
  - Coordinated operation and use of joint system capability
- Accelerated advancement of atmospheric prediction capability
  - Leverage the broader R&D investment
  - NOAA-Navy Investments benefit broader needs

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Background

NUOPC is an ***integration*** of ongoing efforts ***coordinated*** by a Tri-Agency management organization

- **2005** - Tri-Agency established a goal of complementary operational NWP
- **2006** - Reviewed opportunities and alternatives; selected coordinated Global NWP as initial focus area
- **2007** - Developed initial concepts and project plan for NUOPC
  - Initial dialog with Stakeholders, March 2007
  - Phase I approved by Tri-Agency principals group (DoC US for Ocean and Atmospheres, AF/A3O-W, and Navy N84)
- **2008**
  - Jan 22: Executive Steering Group (ESG) appointed Project Manager, approved ESG Charter for signature and authorized further resolution of "Stretch Goals" for IOC-1
  - Follow-up dialog with Stakeholders, April 2008
  - Three Interim Committees established; chairs appointed, membership selected, first meetings conducted in August 2008
  - Executing Phase I

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NUOPC Vision (2015)

- AF, Navy, and NOAA partnership to address common operational global NWP needs
- National NWP system with interoperable components built on common standards and framework (ESMF)
- Unified Multi-model Ensemble
  - Most probable forecast -- e.g. high impact weather
  - Mission Specific ensemble products
- National global NWP research agenda to accelerate science and technology infusion

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Agency Senior Management

- Executive Steering Group (ESG):
  - Executive-level agency representative and associate representative from each agency
  - Provide overall policy and oversight
  - Provide resource commitments on behalf of agency principals
  - Approve Implementation Plan and Concept of Operations
- Agency Principals:
  - NOAA: Undersecretary of Commerce for Oceans and Atmosphere and the Administrator of NOAA
  - AF: Director, Air Force Weather
  - Navy: Oceanographer of the Navy
  - Provide broad policy guidance
  - Ensure sustained agency support
  - Provide approval authority for execution of NUOPC Phases

Approach

- Common global modeling architecture
  - To achieve necessary
    - Operating efficiencies
    - Interoperability
    - Enable benefits of partnership
  - ESMF-based
- Multi-component system
  - Multiple system realizations used operationally to generate ensembles
  - Managed diversity in components to represent sources of forecast error
- Products will address mission needs for
  - Hurricane storm track and intensity
  - Severe weather (for all agencies)
- Ensembles used across all agencies to
  - Define most likely forecast
  - Quantify uncertainty
- Common ensemble-based post-processing algorithms will be explored

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NUOPC Committees & Focus

Common Model Architecture Committee

-Task: Develop common architecture (ESMF) and coding standards as necessary to accelerate transition of research and avoid unnecessary duplication of effort.

-Membership from NOAA, Navy, AF, NCAR, NASA

Technology Transition Processes Committee

-Task: Align agency transition processes to streamline certification of new technology and reduce duplicative recertification among the Tri-Agencies.

-Membership from NOAA, Navy, AF, NCAR, Army

Unified Ensemble Operations Committee

-Task: Develop a unified ensemble operational concept (CONOPS) to allow reliable production and exchange of ensemble products.

-Membership from NOAA, Navy, AF, NCAR

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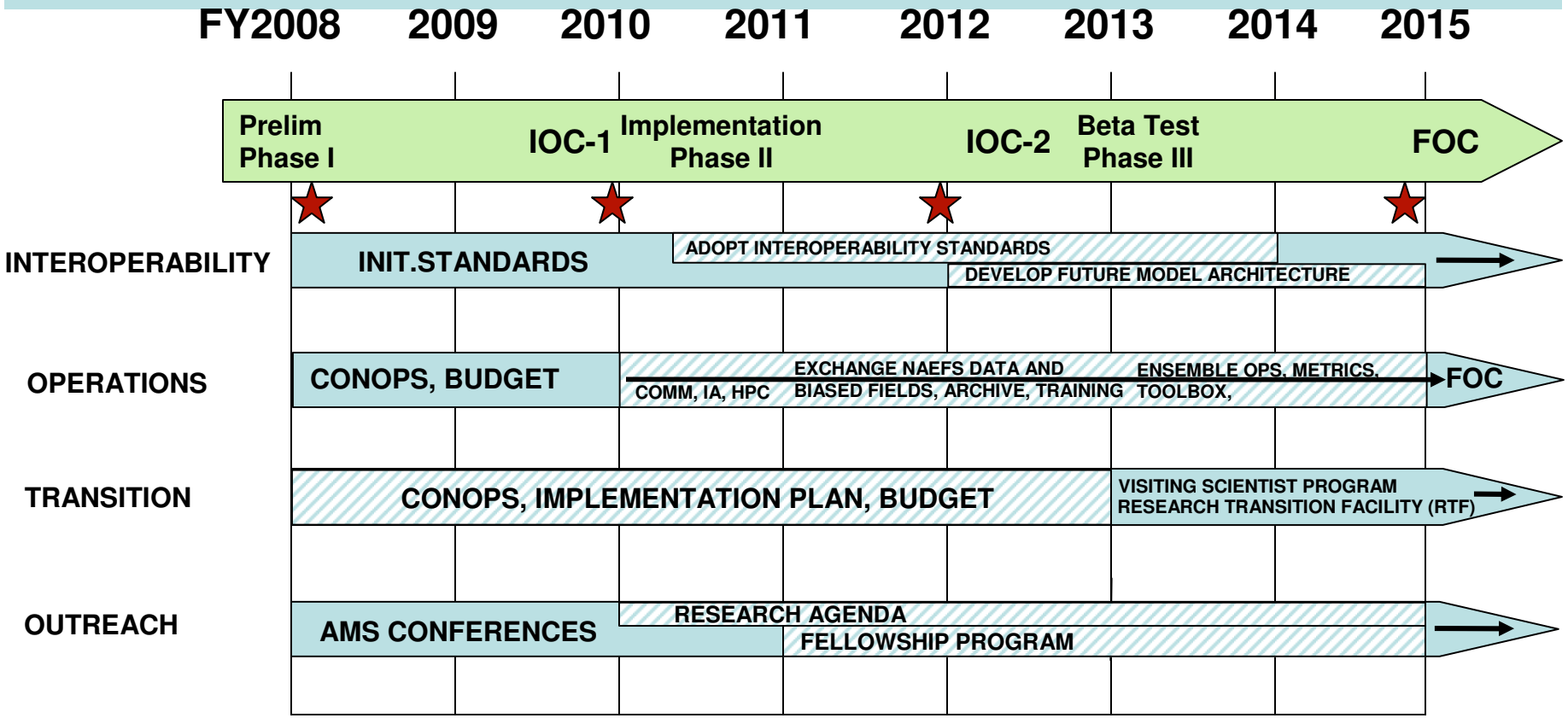
NUOPC Implementation Schedule



DECISION BRIEF TO PRINCIPALS

Next Phase

- Prototype Product Development
  - Joint wind, wave, temp probability product
  - Joint visibility ceiling probability product
  - Hurricane Track Probability
- National R&D Agenda
- Low resolution Joint Ensemble (NAEFS)
- NOAA Hurricane Forecast Improvement Project Demonstration
- Navy Arctic Capability Development

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NUOPC R&D Workshop

- August in Boulder
- Broad participation
- Review Needs
  - Establish common purpose and priorities
  - Driven by operational needs
  - Unify and integrate efforts of research community
- Engage:
  - NSF, NASA, NCAR, DOE, Homeland Security

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