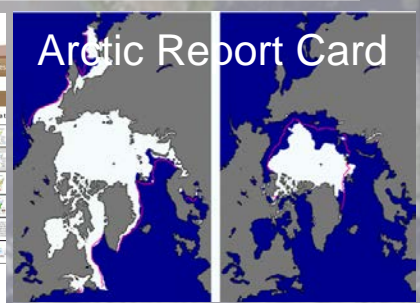
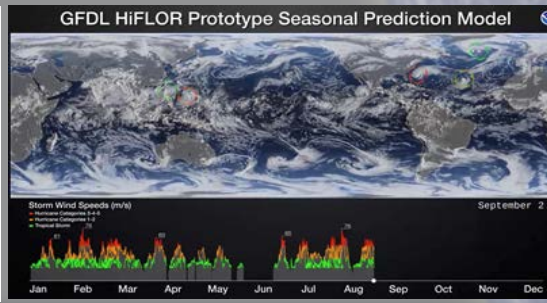
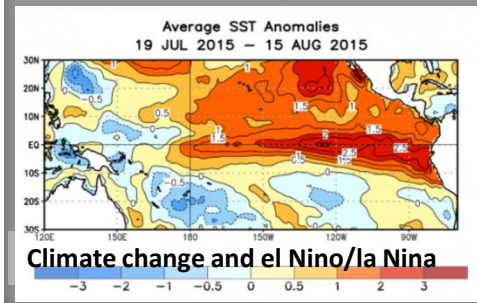
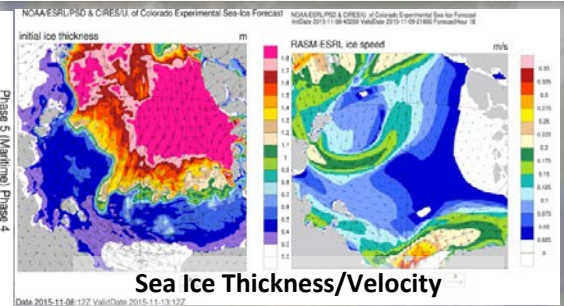
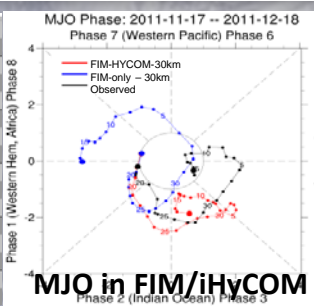
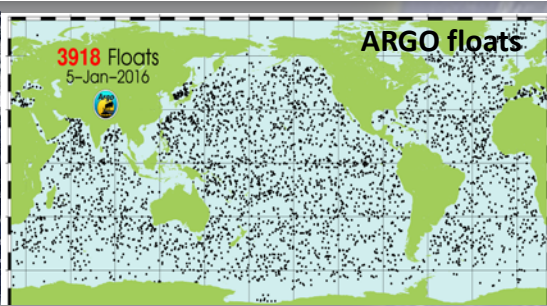
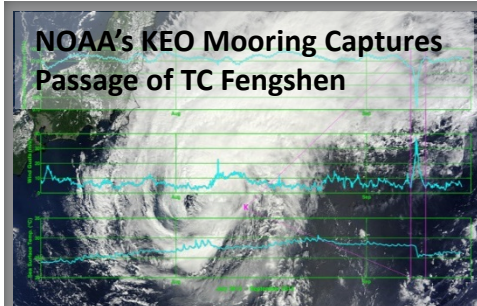


OAR participation in National ESPC

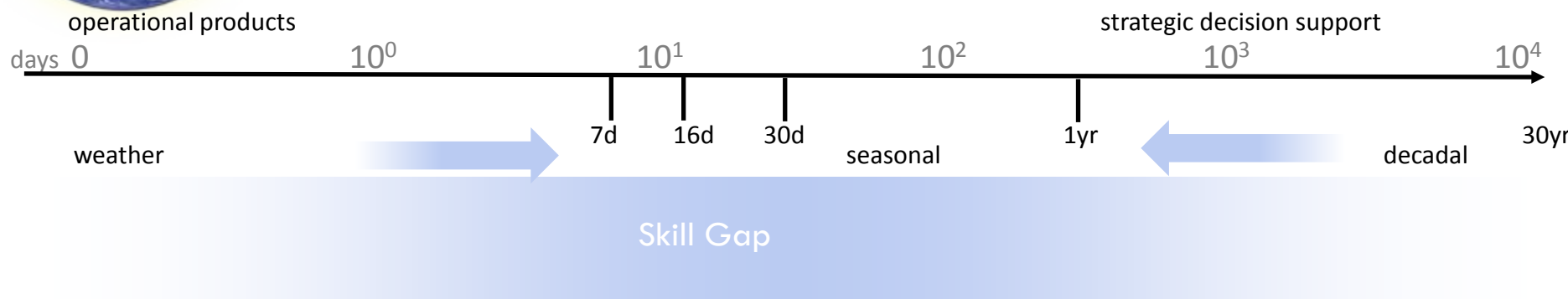
Office of Oceanic & Atmospheric Research (OAR)



Craig McLean
Assistant Administrator for Research
January 13, 2016



Bridging the Prediction/Projection Gap



- To extend weather skill past traditional weather scales:
 - Fully coupled air-ocean-land-ice modeling systems needed
 - Multi-model ensembles
 - Improved data assimilation techniques, particularly for ocean-land-ice
 - To improve climate model skill at subseasonal scales:
 - Data assimilation, reanalysis/reforecast
 - Process representation and higher resolution
- Needed across time scale:
- Improved HPC utilization, incl. advanced architectures
 - Common model architectures
 - Multi-model ensemble management
 - Uncertainty depiction; metrics suited for longer time scales
 - Product creation

Research agencies: work within mission expertise to improve understanding of predictability and prediction skill; ESPC partnership with USGCRP

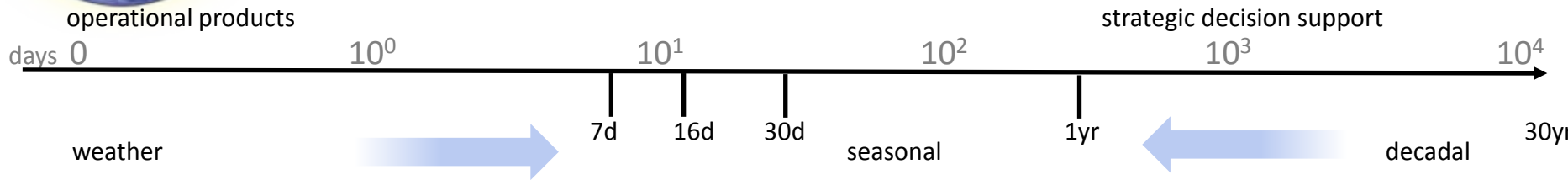
Operational agencies: exploit the research for skill improvements

Need strategic-level coordination of issues





OAR strengths



ESRL:

FIM/iHyCOM participation in sub-seasonal NMME
 Process-based analysis/testing of systematic NWP errors:

- Ocean coupling crucial to MJO propagation
- Improved cloud parameterizations
- Improvements to summer sea-ice forecasts, improving NH NWP

GFDL:

Seamless high-res weather/climate modeling: seasonal, decadal, centennial time scales

CM2.5-HiFLOR/FLOR: CONUS regional skill in seasonal tropical cyclone predictions; NMME participation.

FV3: NGGPS Phase 2 dynamical core selection

Earth System Modeling: atm chem, biogeochem, ecosystems → improved understanding, predictions/projections.

ESRL: ESMF (common model architecture)
 greenhouse gas monitoring networks

OAR Programs involving the external community

OWAQ

CPO, e.g. NMME





Predictability Science in Support of Operational Prediction

Major agency contributions

Computing (NSCI-relevant)

- Not just for non-hydrostatic atmosphere: also higher-resolution ocean/ice modeling at longer time scales
- Need HPC increases
- Port models to new machines/architectures

Data assimilation, esp. for non-atmosphere model components (NSCI-relevant)

- Ocean, ice (land, hydrology)
- New techniques needed for these media? Existing techniques optimized for atmosphere

One model vs. multi-model ensembles (NRC S2S report)

- Single-model idea recurs, but science is a generation or more away
- Multi-model ensembles (presently) better to both describe uncertainty, cover time span





Agency Roles and Responsibilities

