The Navy's Operational Oceanography Program

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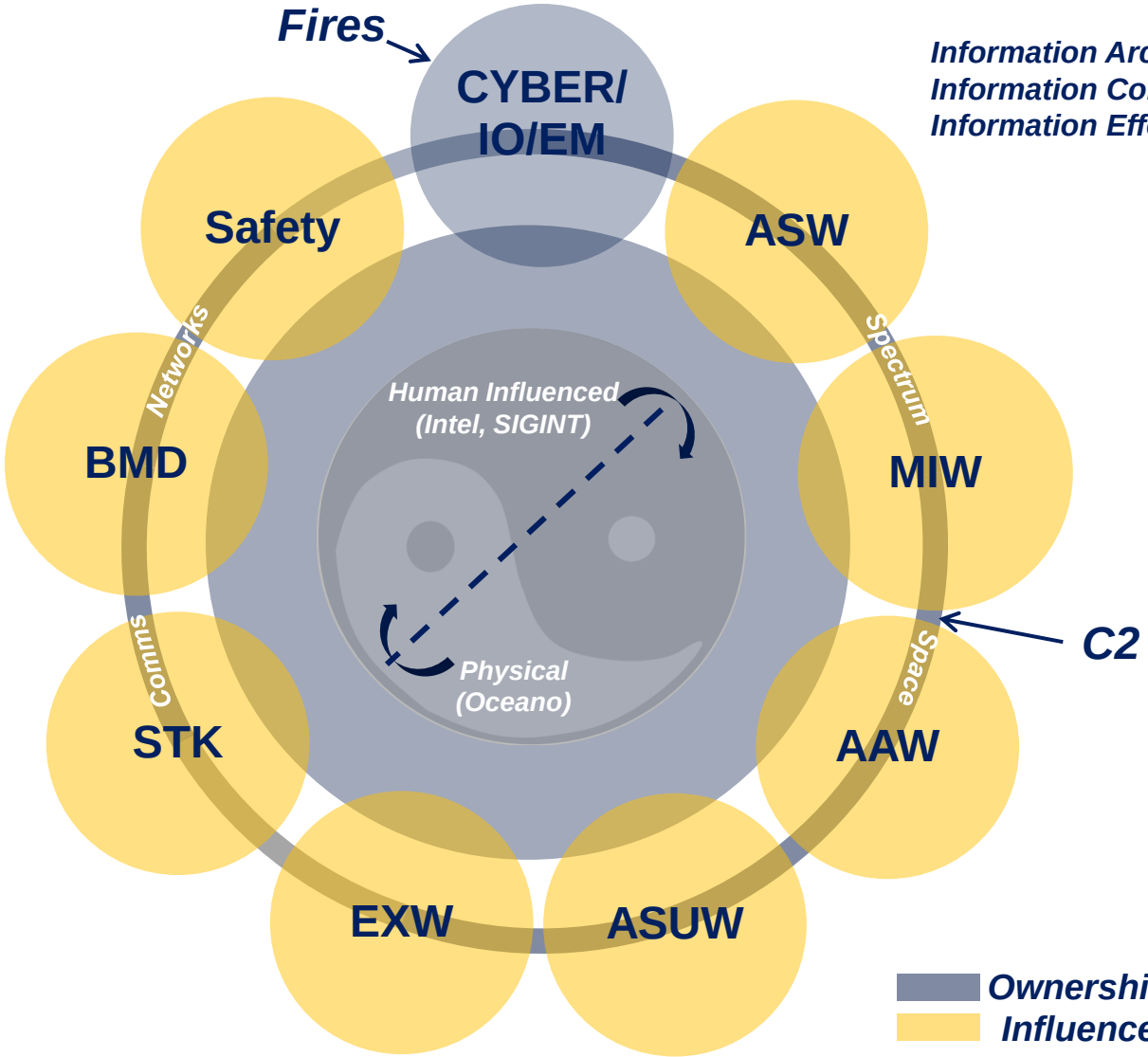
Our Evolution

2009	Operational Oceanography as part of Information Dominance
2005	Oceanography/Hydrography/Weather Services/Astrometry/Time
1977	Oceanography/Hydrography/Weather Services
1972	Oceanography/Hydrography ~~Charting~~
1962	Oceanography/Hydrography/Charting
1917	Weather Services
1874	Hydrography/Charting; Astrometry/Time
1830	Hydrography/Charting/Astrometry/Time

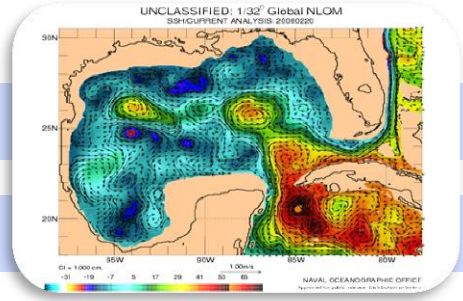
A Conceptual Model of Information Dominance



Information Architecture => Assured C2
Information Content => Battlespace Awareness
Information Effects => Integrated Fires

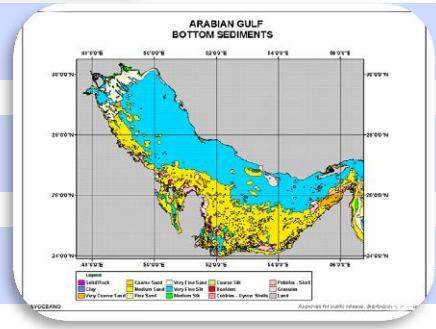
Ownership
Influence

Operational Oceanography Core Disciplines



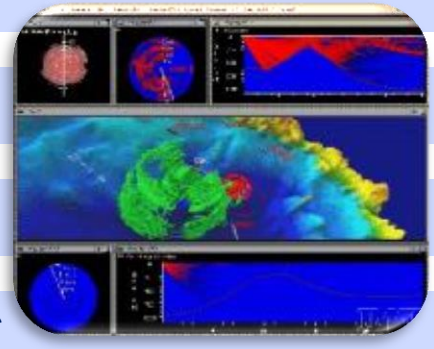
PHYSICAL OCEANOGRAPHY

HYDROGRAPHY/BATHYMETRY



GEOPHYSICS

ACOUSTICS



METEOROLOGY

GEOSPATIAL INFORMATION/SERVICES

PRECISE TIME

ASTROMETRY

EARTH ORIENTION

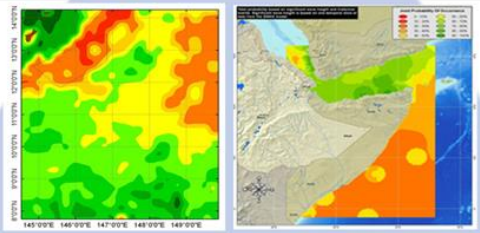
Battlespace On Demand
Linking Forecasts to Decisions

- Joint / Fleet Ops
- Warfighting & Readiness
- GFM
- Sailors/Civ/Fam
- Safety

Decision Superiority: Making better decisions faster than the adversary

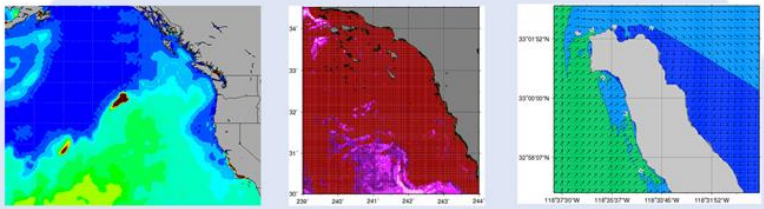
Decision — 3

- Options
- Courses of Action
- Sensor Employment
- Asset Allocation
- Timing
- Quantified Risk



Performance — 2

- How the predicted environment affects the Fleet and Joint Forces



Environment — 1

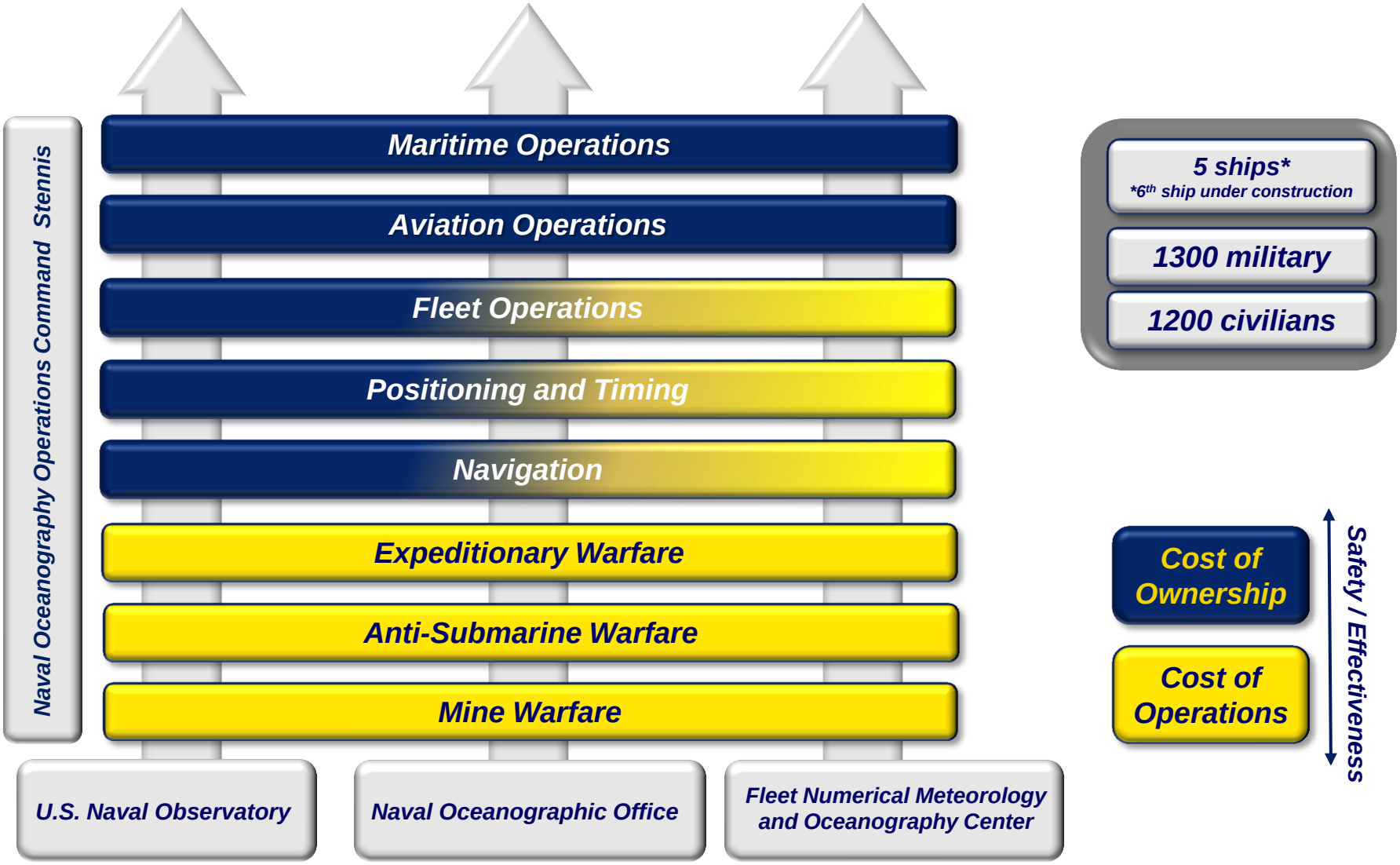
- The predicted environment

Data — 0

- Observations, measurements, satellites, gliders, buoys, etc.

INITIAL AND BOUNDARY CONDITIONS

Operational Oceanography Lines of Operations



Current Naval Oceanography Organization

Commander, Naval Meteorology and Oceanography Command

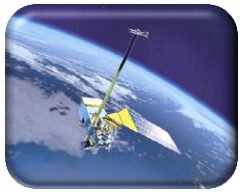
- **Fleet Numerical Meteorology and Oceanography Center (FNMOC)** — Monterey, CA
- **Naval Meteorology and Oceanography Professional Development Center (NMOPDC)** — Gulfport, MS
- **U.S. Naval Observatory (NAVOBSY)** — Washington, D.C.
- **Naval Oceanography Operations Command (NOOC)** — Stennis Space Center, MS
  - Fleet Weather Center San Diego
  - Fleet Weather Center Norfolk
  - Joint Typhoon Warning Center
  - Navy METOC ASW Center SSC
  - Navy METOC ASW Center Japan
  - Navy METOC MIW Center
  - Navy METOC NSW Center
- **Naval Oceanographic Office (NAVOCEANO)** — Stennis Space Center, MS
  - Fleet Survey Team
  - Naval Ice Center

Enabling Capabilities



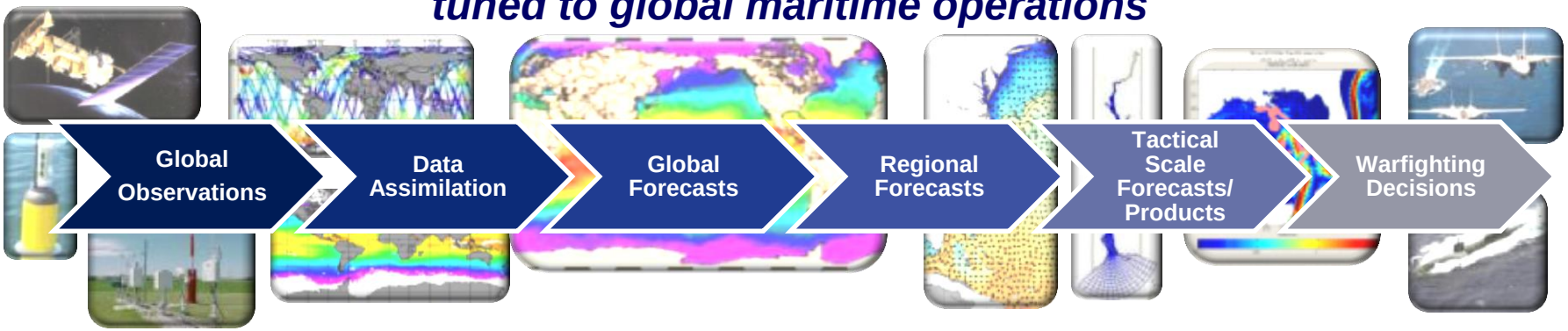







Modeling and Prediction

Deliver world-class ocean, atmospheric, and ice forecast capability tuned to global maritime operations



High Performance Computing Environment

- ***Coupled forecast systems***
- ***Modern data assimilation***
- ***Global***
- ***Optimized over water***

- *NOGAPS/NAVGEM*
- *COAMPS*
- *EFS*

- *PIPS*

- *NCOM*
- *HYCOM*
- *WW3*
- *DELFT 3D*

Deployable Oceanography Teams

Antisubmarine Warfare: 13

Strike: 9

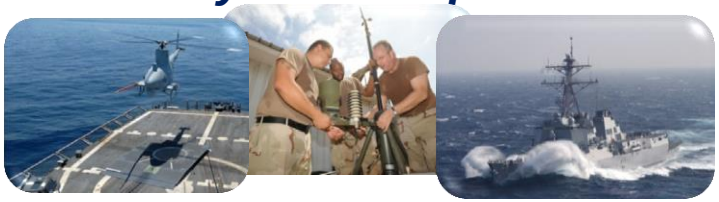
Amphibious Warfare: 9

Navy Special Warfare: 6

Navigation/HADR: 7

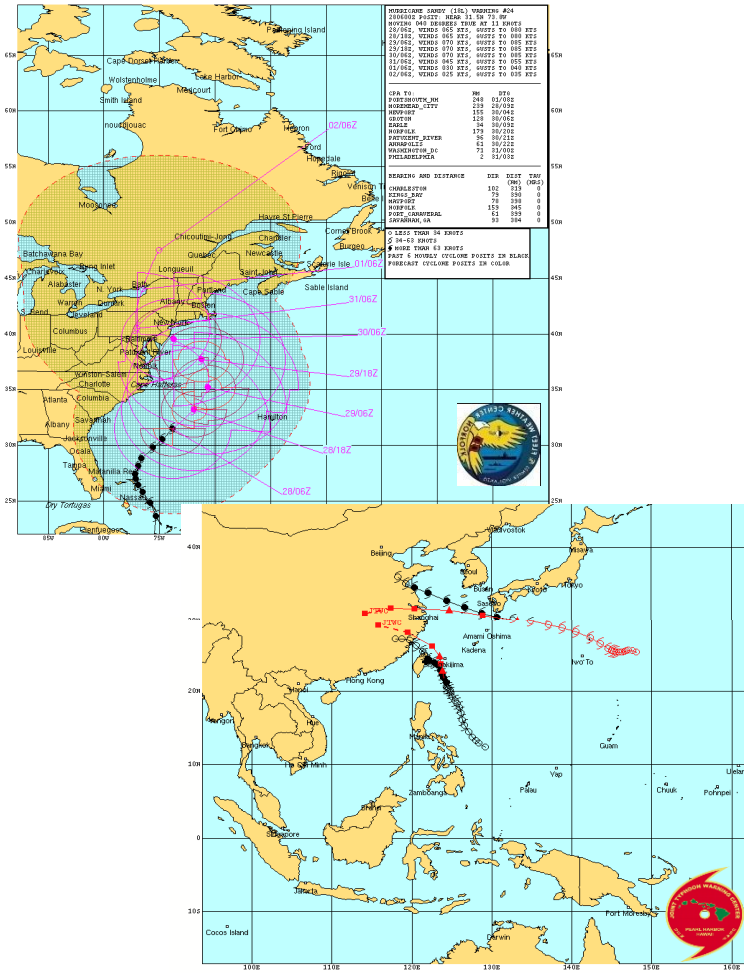
Mine Warfare: 2

Expeditionary/ISR/Independent Duty: 16

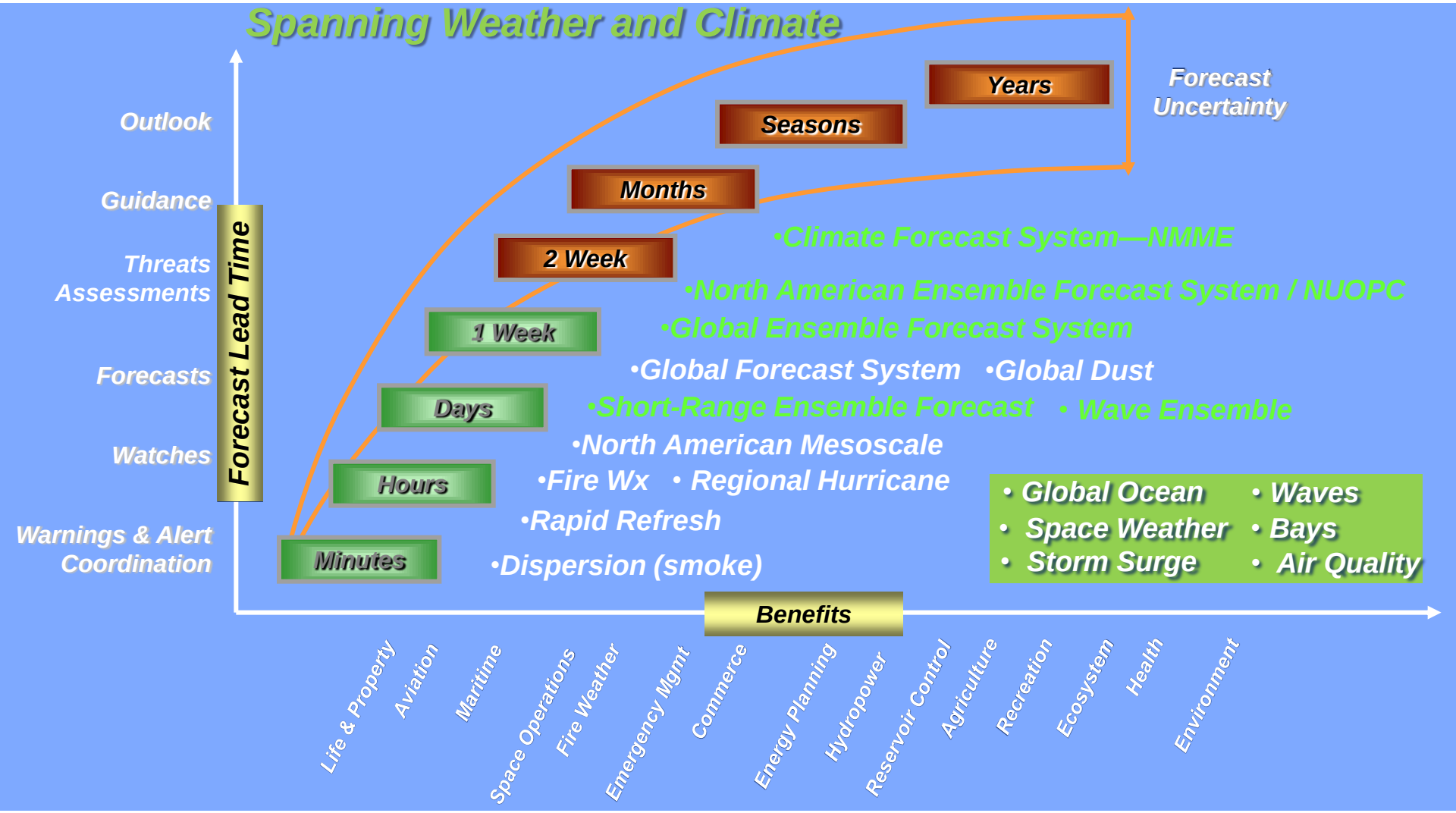


Operational Safety

- ***Maritime Safety***
  - *Optimum Track Ship Routing*
  - *Maritime Weather Forecasts (WEAX)*
  - *OPAREA Forecasts*
  - *Sortie Recommendations*
- ***Aviation Safety***
  - *Flight Weather Briefs*
  - *Airfield Observations/Forecasts*
  - *Optimum Path Aircraft Routing*
- ***Resource Protection***
  - *Pacific/Indian Ocean Tropical Cyclone Warnings*
  - *Tropical Cyclone Conditions of Readiness / Sortie Recommendations*
  - *Base & Regional Severe Weather Warnings*
  - *Tsunami Information for Department of Defense*



Earth System Prediction Capability



Discussion