U.S. GODAE: Global Ocean Prediction with

HY
COM

HYbrid
Coordinate
Ocean Model

Community Effort: NRL, U. of Miami, FSU, NASA-GISS, NOAA/NCEP, NOAA/AOML, NOAA/PMEL, PSI, FNMOC, NAVOCEANO, SHOM, LEGI, OPeNDAP, UNC, Rutgers, USF, Fugro-GEOS, Orbimage, Shell, ExxonMobil

Objectives and Goals

- A broad partnership of institutions that collaborate in developing and demonstrating the performance and application of eddy-resolving, real-time global and basin-scale ocean prediction systems using HYCOM.

- To be transitioned for operational use by the U.S. Navy at NAVOCEANO and FNMOC and by NOAA at NCEP.

Objectives and Goals

- Strong participation of the coastal ocean modeling community in using and evaluating boundary conditions from the global and basin-scale ocean modeling prediction systems

- Efficient data distribution (100 Terrabytes Storage Area Network)
  - The data are available to the community at large within 24 hours via Live Access Server (LAS), ftp, and OPeNDAP at http://www.hycom.org

Roadmap

- ## Basin-scale

  - FY07: Evaluation of data assimilation schemes [MVOI, EnOI, SEEK and ROIF]. Improvements to the present near real time NOAA/NCEP North Atlantic configuration. Overlap in FY07 of the near real time NRL North Atlantic configuration and of the global configuration for assessment of the global system in the Atlantic.

 - The NOAA/NCEP Pacific configuration to become operational in FY08.

Roadmap

- Global configuration
  - Development has been taking place since FY04.
  - Transition to NAVOCEANO (1/12º) with MvOI (NCODA) in FY07.
  - Operational testing in year FY08.
  - Increase to 1/25° resolution globally (~3-4 km mid-latitude) by the end of the decade

Global HYCOM configuration

- Horizontal grid: 1/12° equatorial resolution
  - 4500 x 3298 grid points, ~6.5 km spacing on average, ~3.5 km at pole, 5 m minimum depth
- Mercator 79°S to 47°N, then Arctic dipole patch
- 32 σ_2* vertical coordinate surfaces:
- GISS mixed layer model
- Thermodynamic sea-ice model
- Surface forcing: wind stress, wind speed, thermal forcing, precipitation, weak relaxation to climatological SSS
- Monthly river runoff (986 rivers)
- Initialized from January climatology (GDEM3) T and S
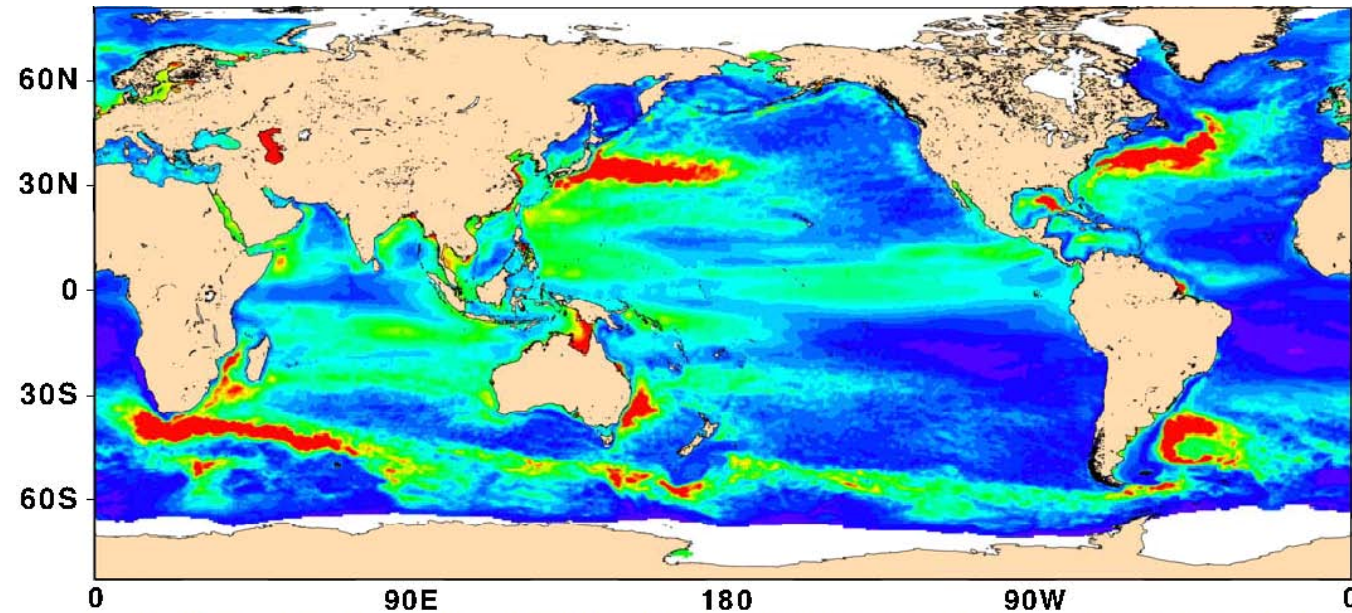
1/12° Global HYCOM Snapshot: SSH and ice (gray)

GLBa0.08
ci 3.0
-205. to 215.

May 2 model year 8

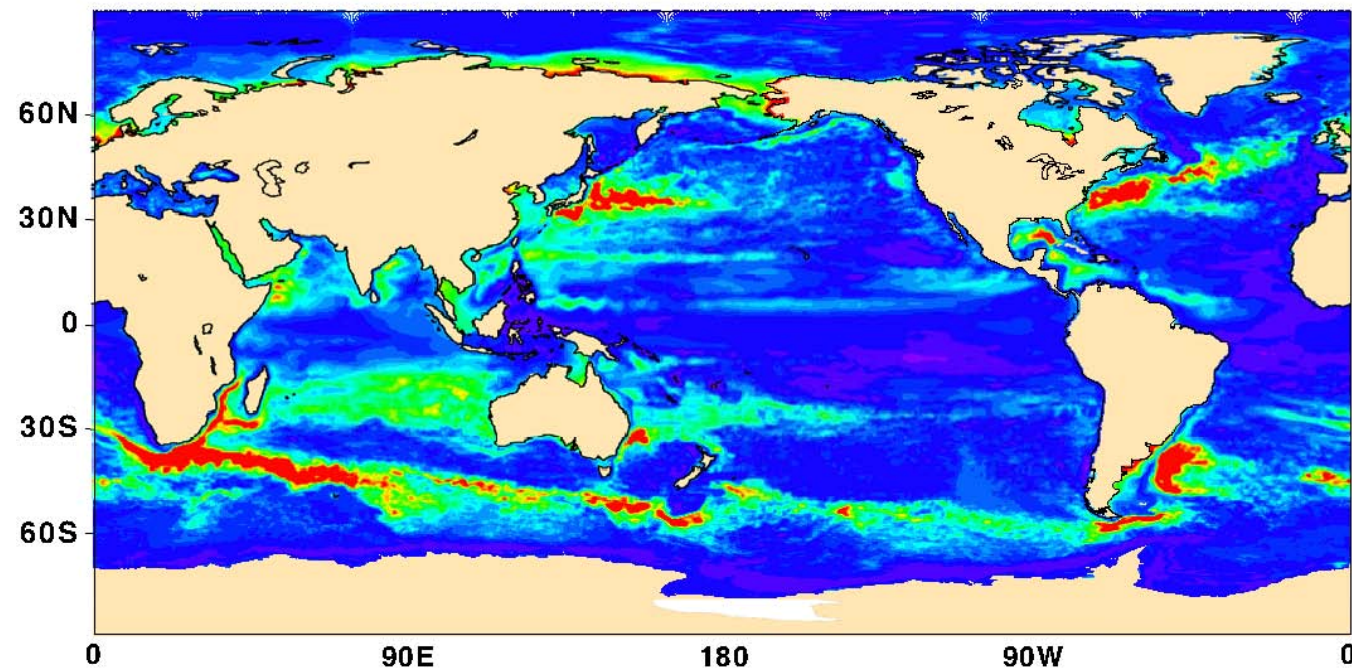-150   -100   -50   0   50   100   150
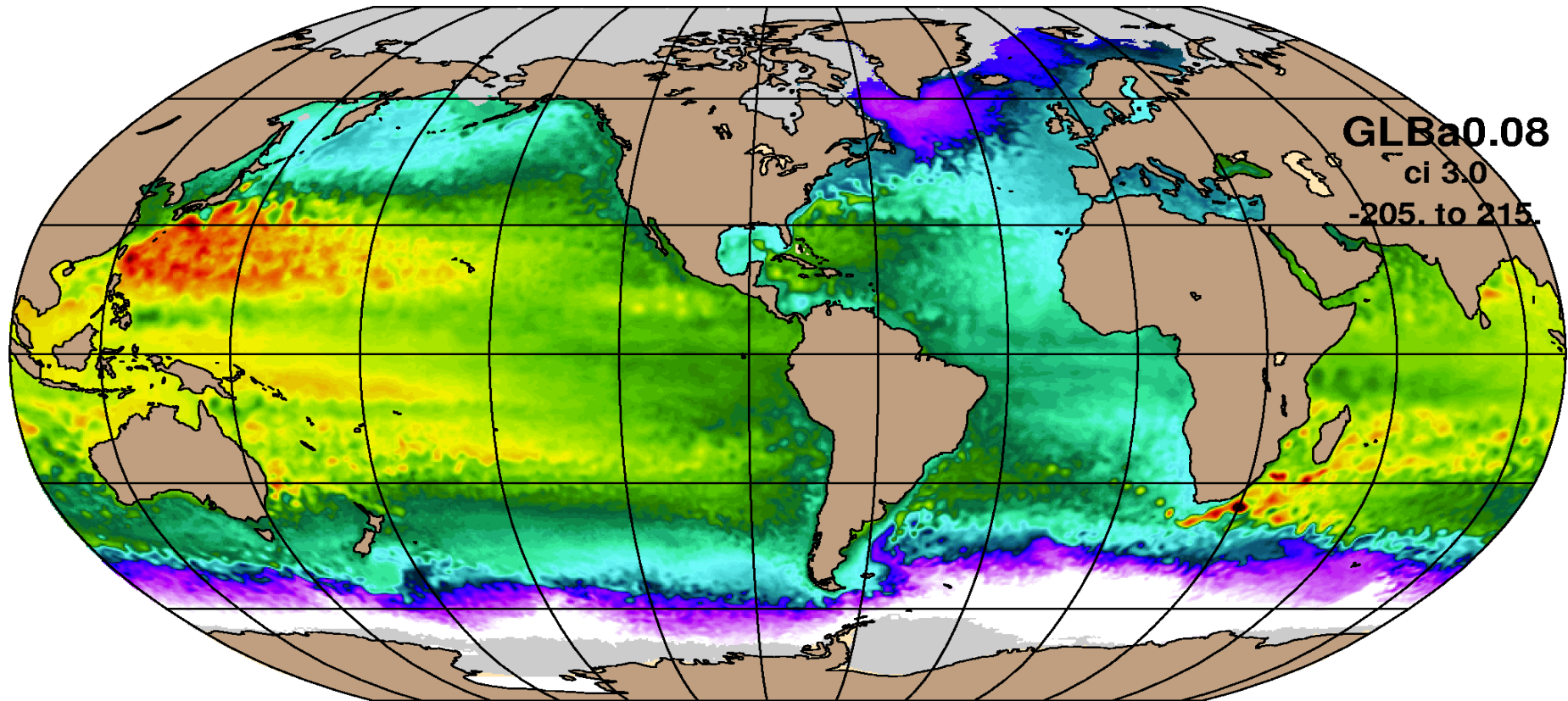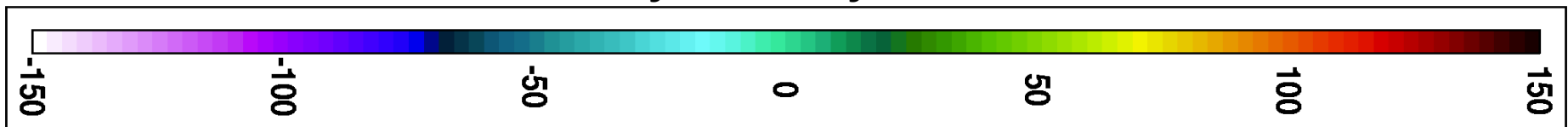
216,000 CPU hrs/model year on 784 IBM Power 4+ CPUs

7.2 TB/model year for daily 3-D output

Free Running Global HYCOM (Metzger et al.)

1992 – 2005 SSH variability based on T/P, ERS-1, and ERS-2 altimeters (Courtesy CLS)

SSH variability from 1/12° global HYCOM σ_2* with climatological wind and thermal forcing

Roadmap

- Product evaluation

  - Assessment of the outputs by comparison to independent observations

  - Comparison with other GODAE products (i.e. MERSEA collaboration)

  - Strong involvement of coastal ocean modeling groups to use and evaluate boundary conditions provided by the global and basin HYCOM real time prediction system outputs

AGENDA

- THIS IS AN INFORMATION EXCHANGE MEETING. DO NOT HESITATE TO PRESENT THE NUTS AND BOLTS ASPECTS OF YOUR WORK.

- Suggested time for the presentations is +/- 15 minutes. In addition to a discussion of your results, it would be most useful to include in your presentation a status report as well as your vision for the following year.