



**<Bill O'Reilly, SIO>**  
**Current Situation and CI Requirements**

OOI CyberInfrastructure  
Science User Requirements Workshop:  
San Diego  
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# Background and Overview



# Wave Models

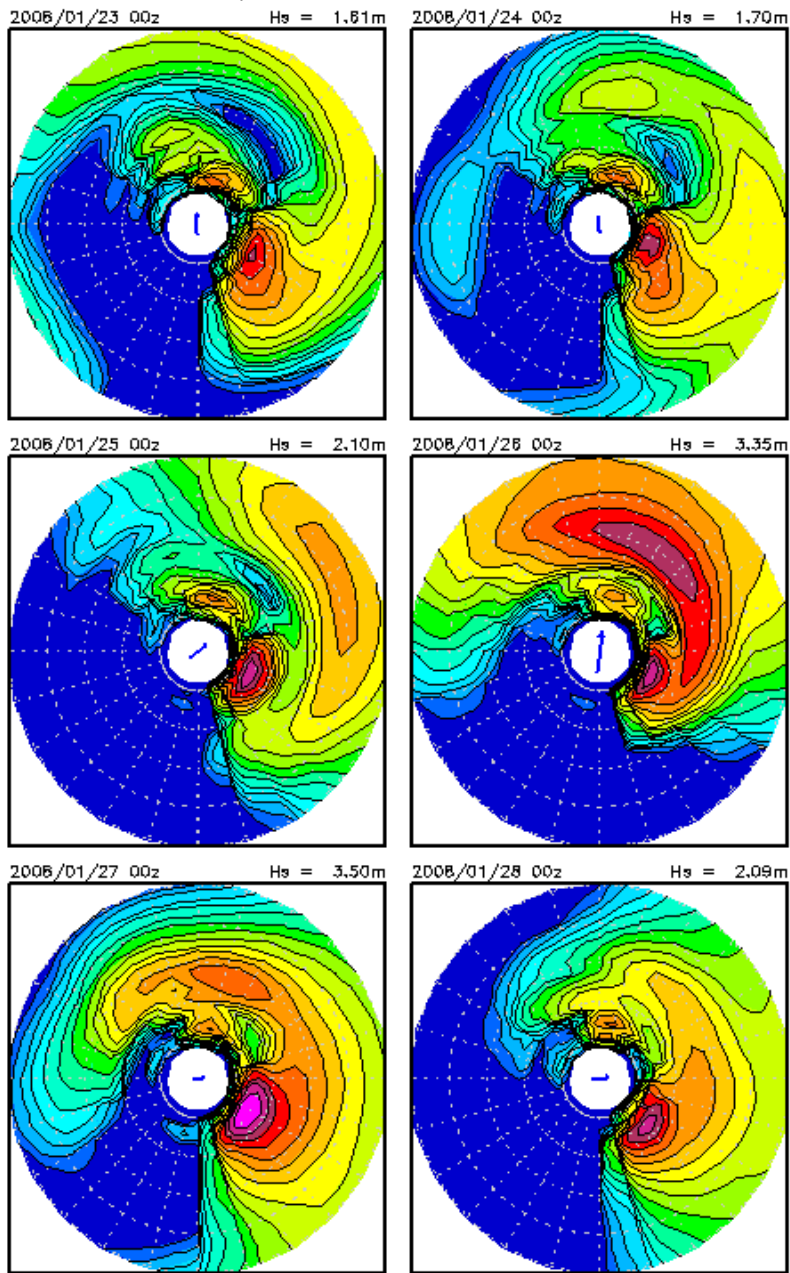
- **Inputs:** Wind, Bathymetry, Currents, Waves @ Boundaries
- **Output:** 2D Wave Spectra

Wave Energy ( frequency, direction)

typical spectral

resolution:	( 25 , 24 )	15 deg directional bins
	(25 , 72 )	5 deg bins

# Spectra for 46069



# Wave Models

- **Typical Spatial Resolution**

0.5 deg (~50km) Global Models

0.1 deg (~10km) Regional Models

0.001 deg (~100m) Shallow Water Models

- **Typical Time Resolution**

3 hours Global, Regional

1 hour Shallow Water

- **Data Assimilation**

JASON/ENVISAT Altimeters

SAR (Synthetic Aperture Radar)

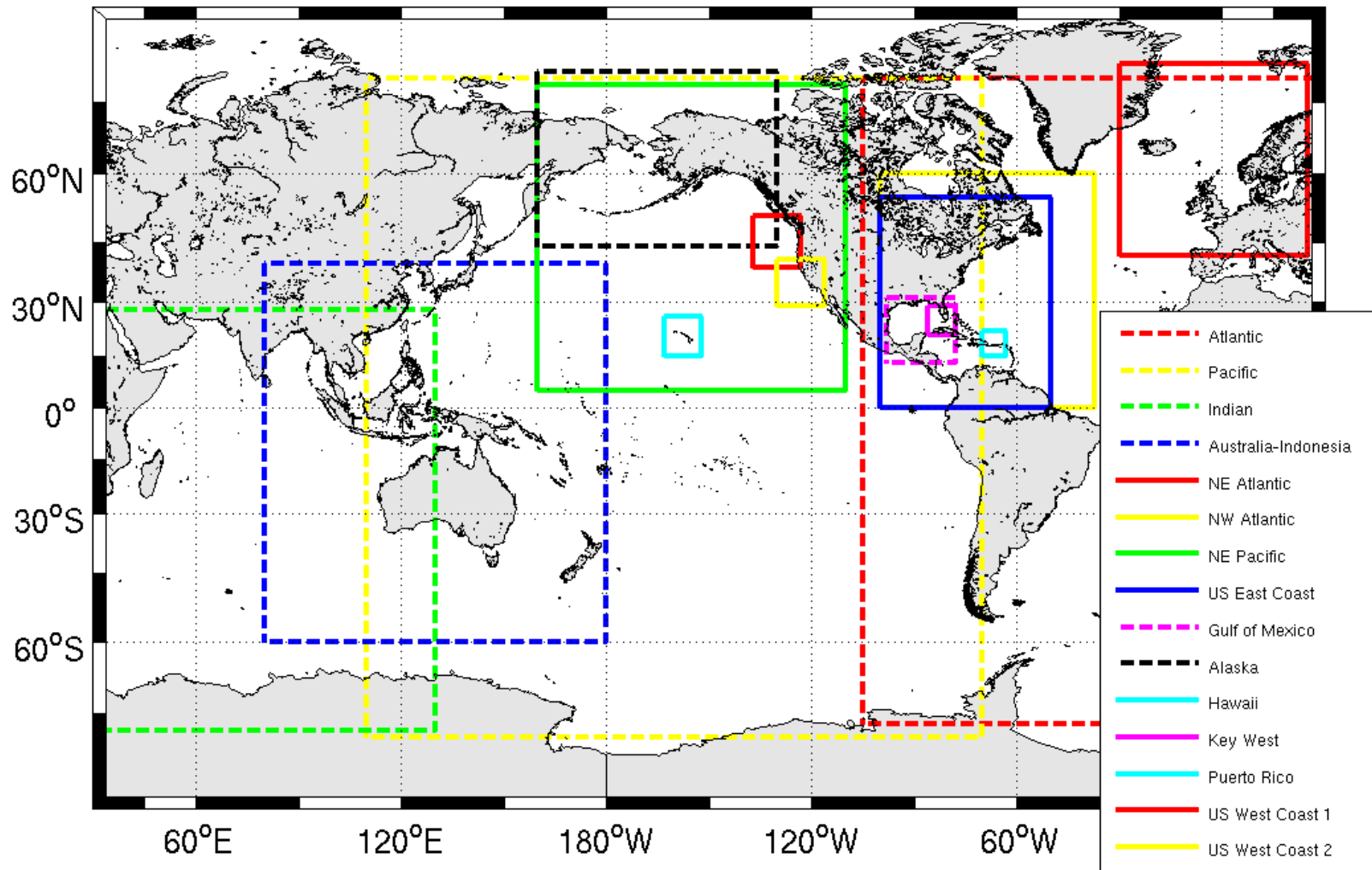
Moored Buoys

Global/Regional

Global/Regional

Global/Regional/Shallow Water

# WAVEWATCH III Regional Grids



# Wave Models

- **Distribution Challenges**

0.5 deg (~50km) Global Models = ~130k model output points

Global spectra needed for regional & shallow water  
model boundary conditions

- **Computational Challenges**

- increasing resolution of :

- wave energy ( frequency, direction, space, time)

- nonlinear 2D Spectra evolution