



Selection of climate models for regional ecosystem projections

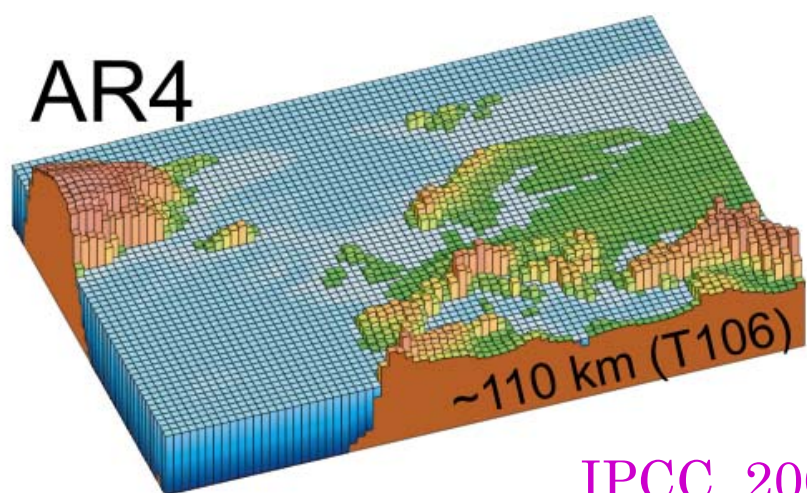
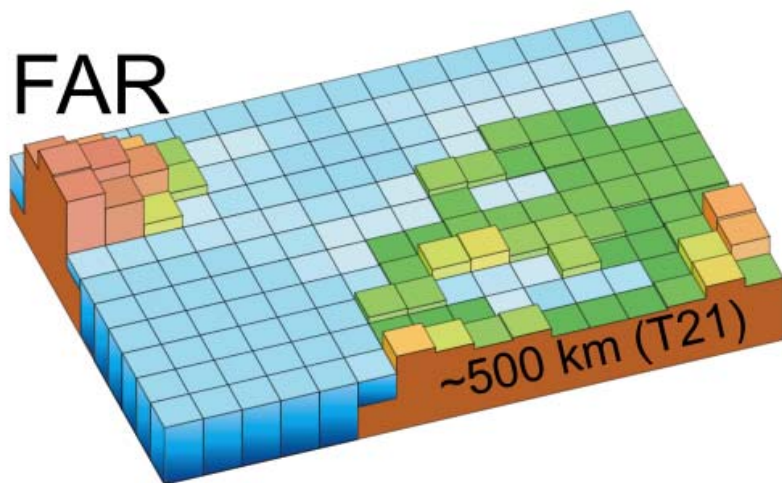
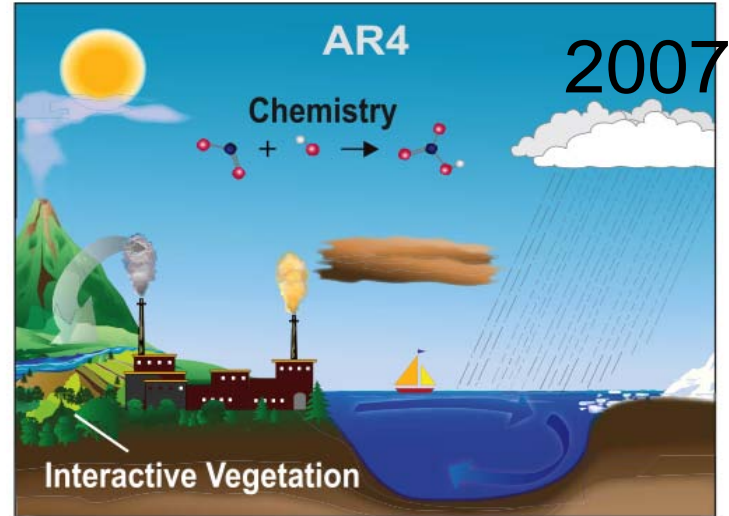
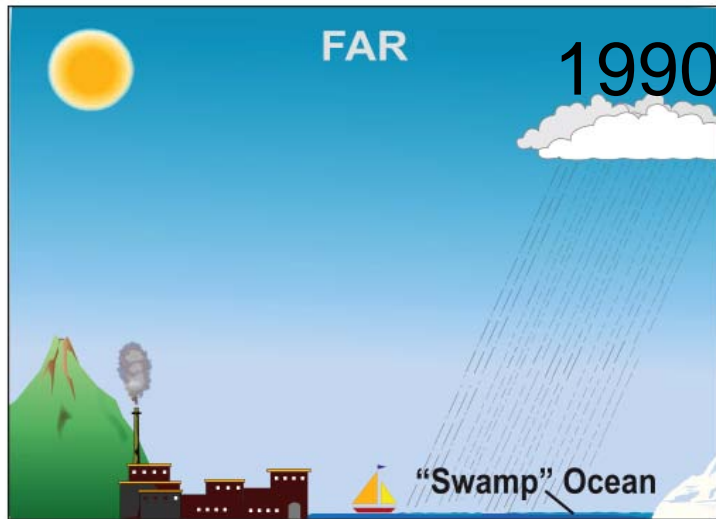
Muyin Wang¹,

James E. Overland² & Nicholas A. Bond¹

¹ University of Washington

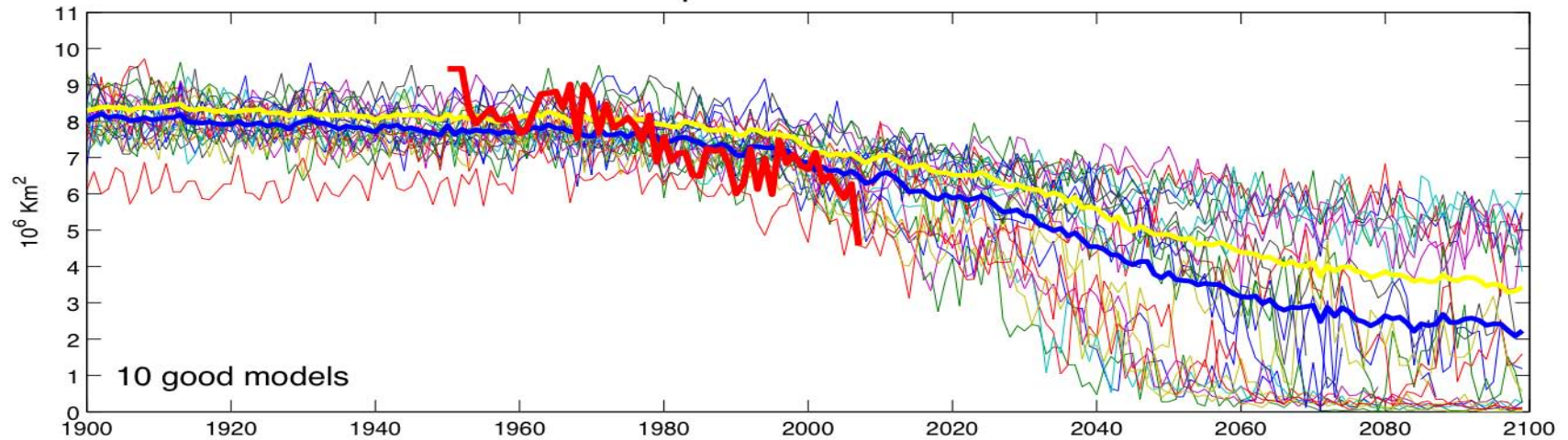
² PMEL/NOAA

The Progress of Climate Models

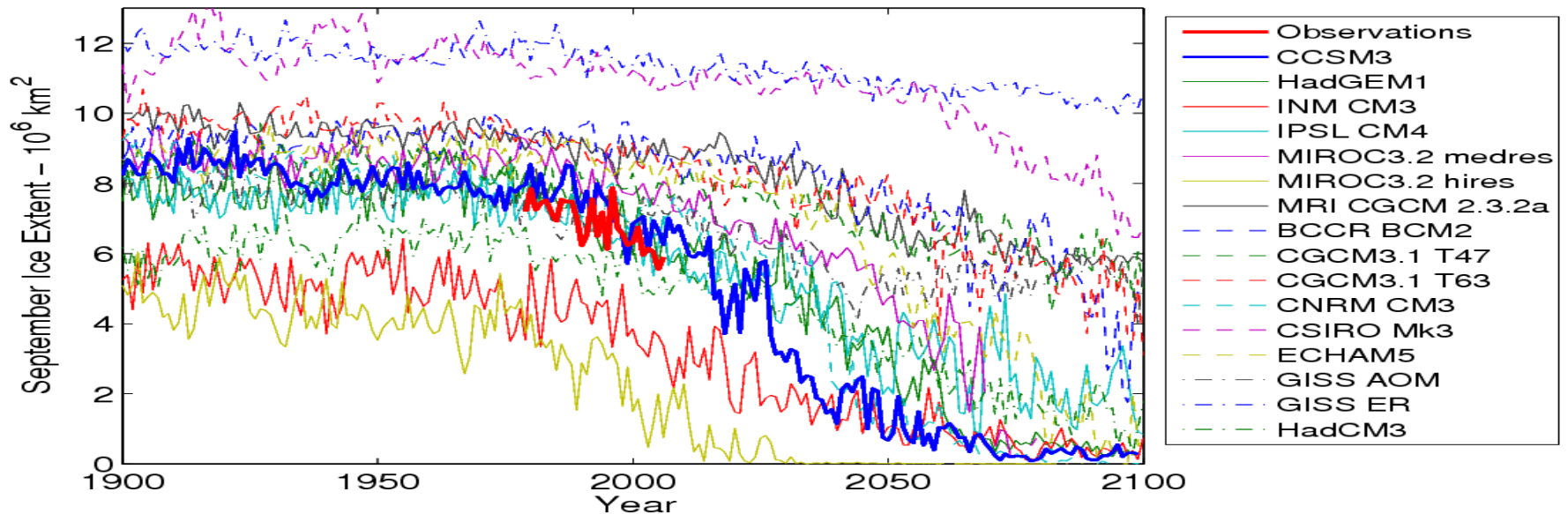


NH Sept Sea Ice Extent

A1B September NH Ice Extent



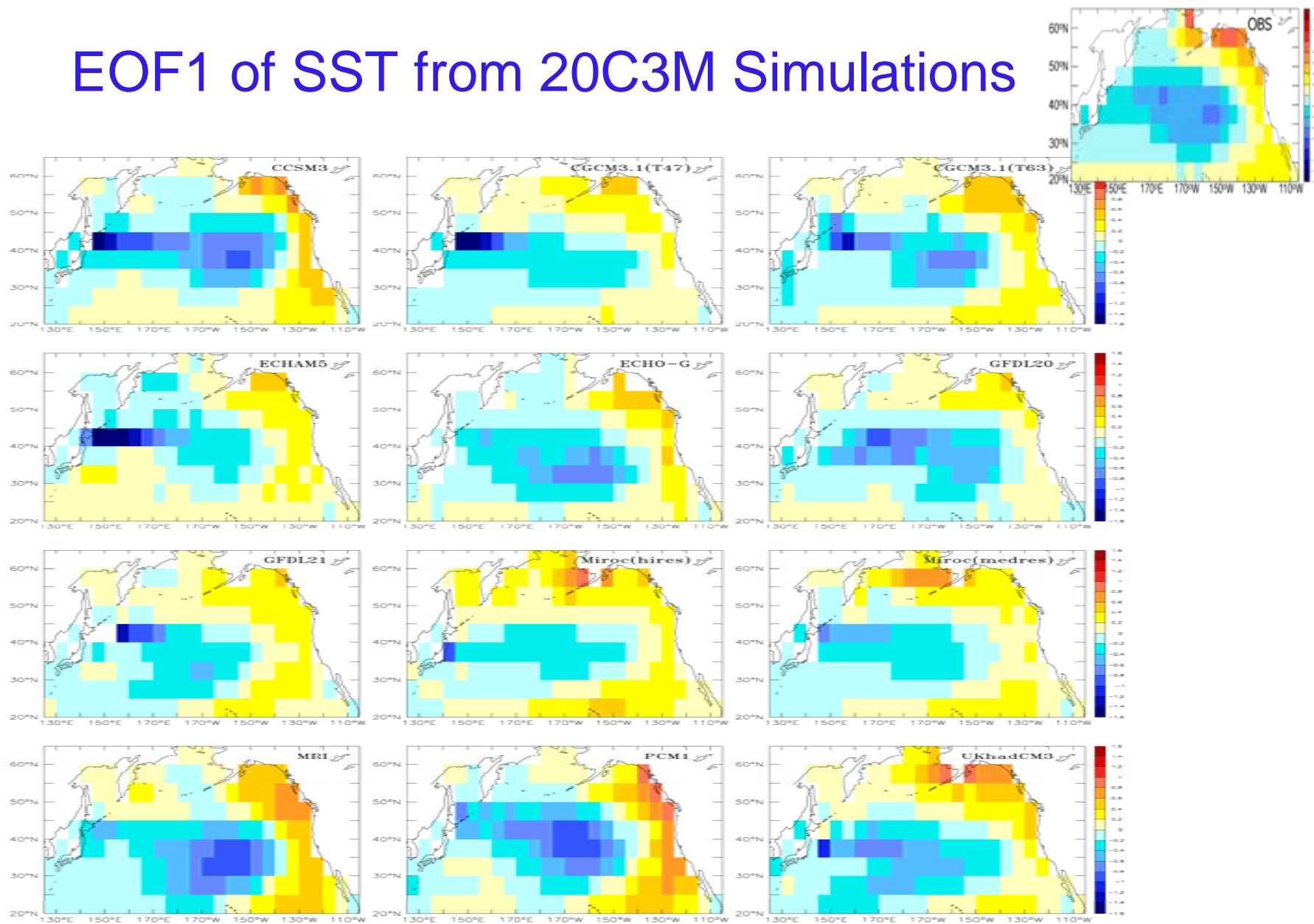
IPCC Models A1B Scenario



Common practices to assess models' performance

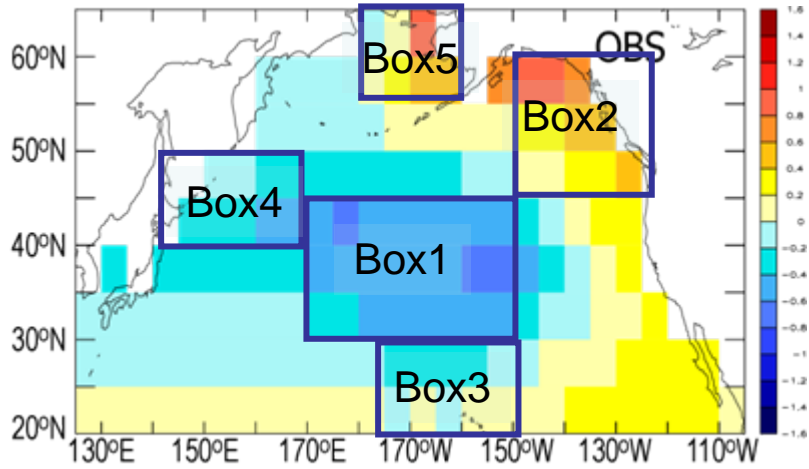
- Mean climate
- Variance
- Seasonal cycle
- Correlation (No)
- Trends (Not so good)

EOF1 of SST from 20C3M Simulations

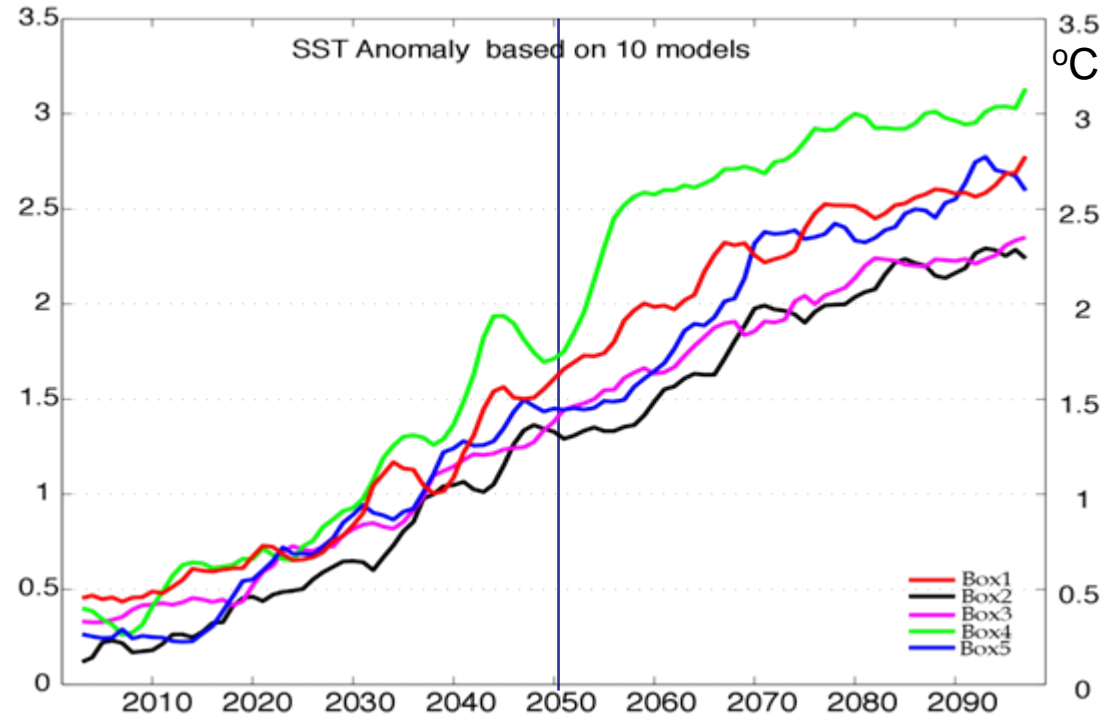


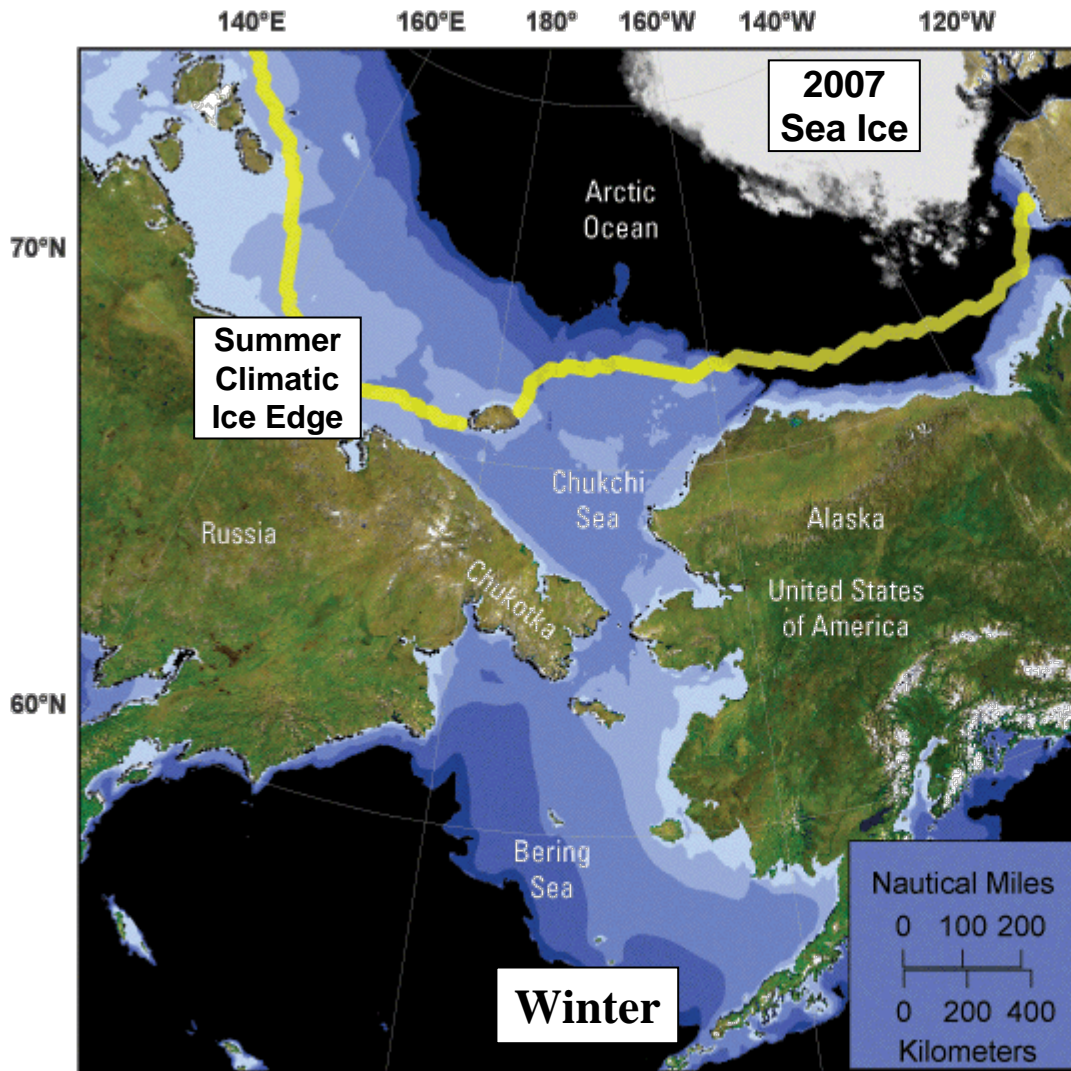
Variables important to the North Pacific Ecosystem

- PDO
 - SST
 - Sea Ice
 - Aleutian Low/NPGO
 - Upwelling
 - CC



**Projected
Winter SST ANOMALY**
relative to 1980-99 mean
under A1B scenario





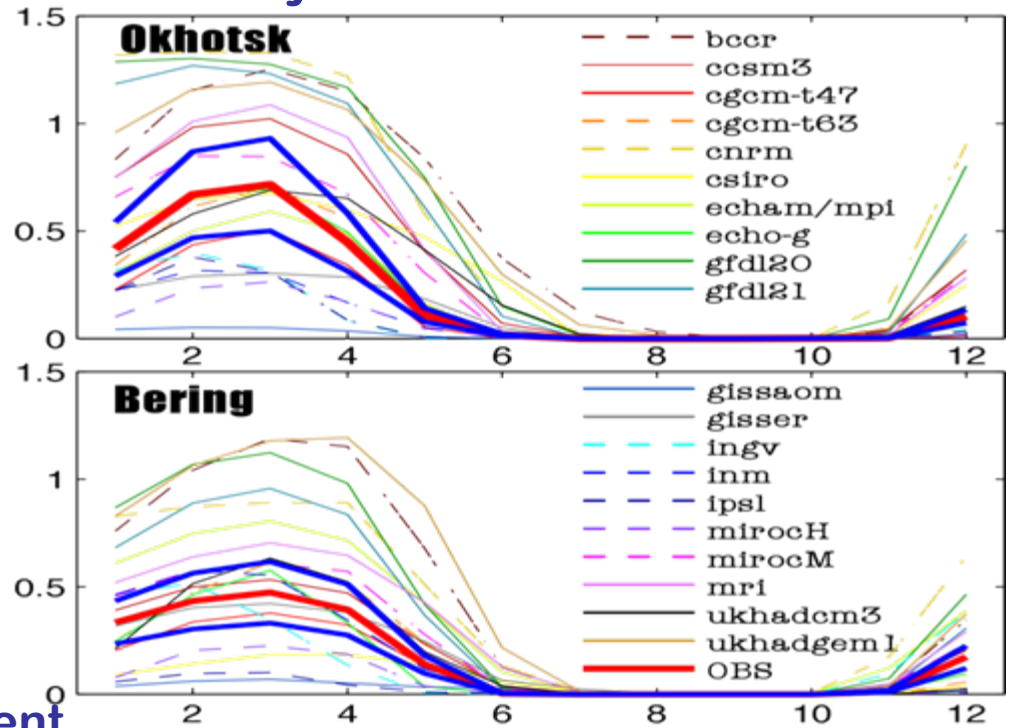
Multi-year sea ice



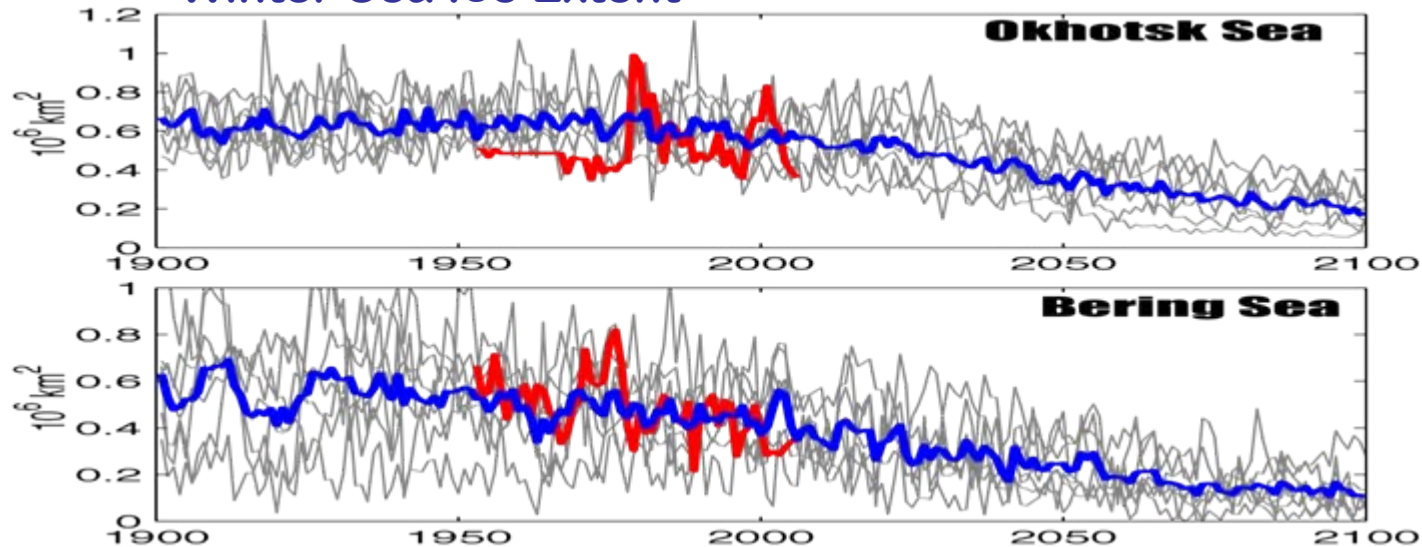
First year sea ice



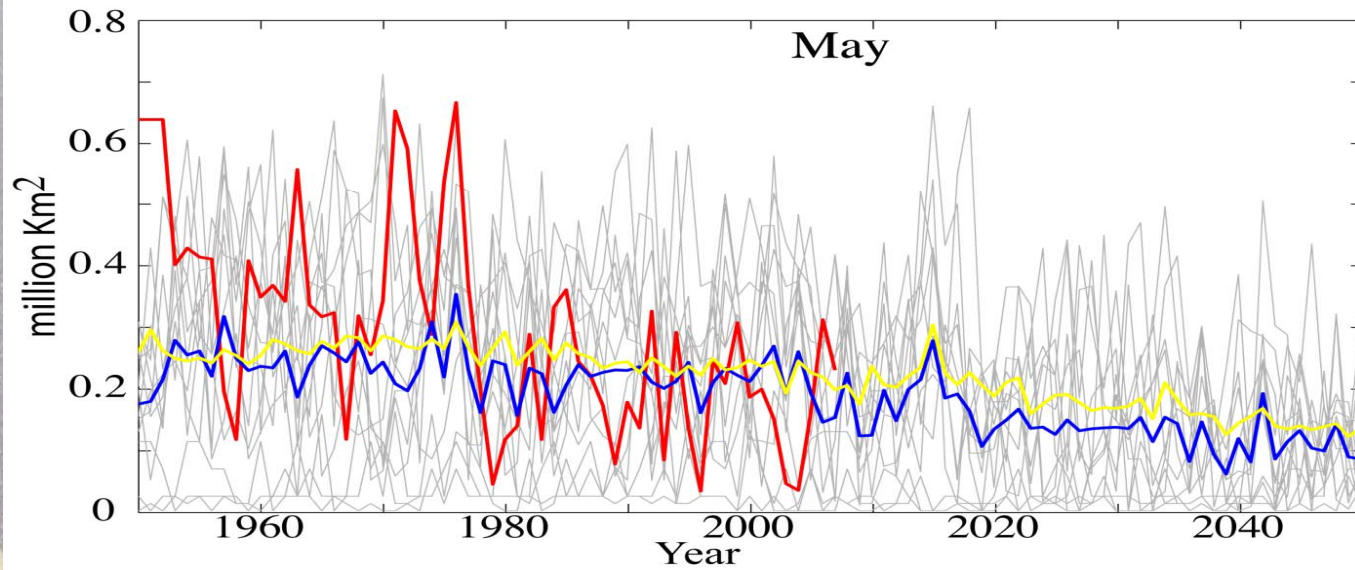
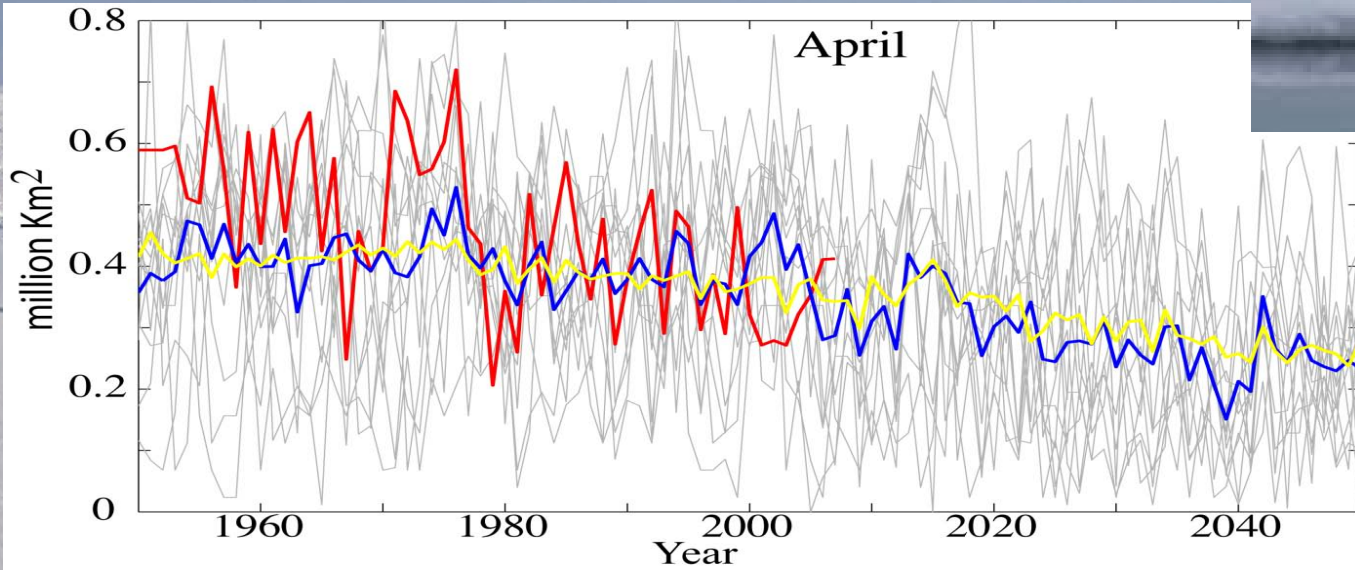
Seasonal Cycle of Ice Extent for 1980-99



Winter Sea Ice Extent

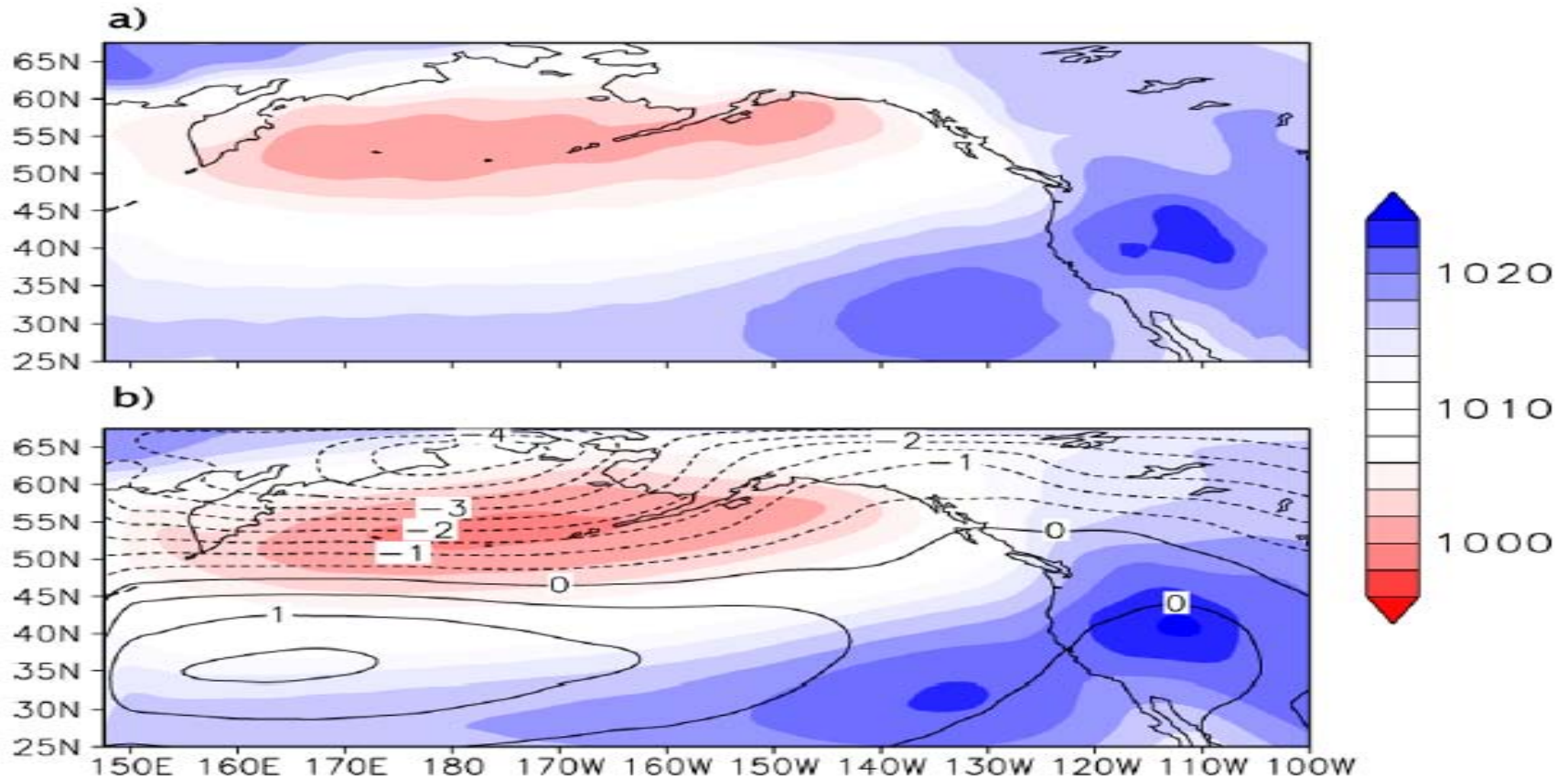


NE Bering Sea Ice Projection



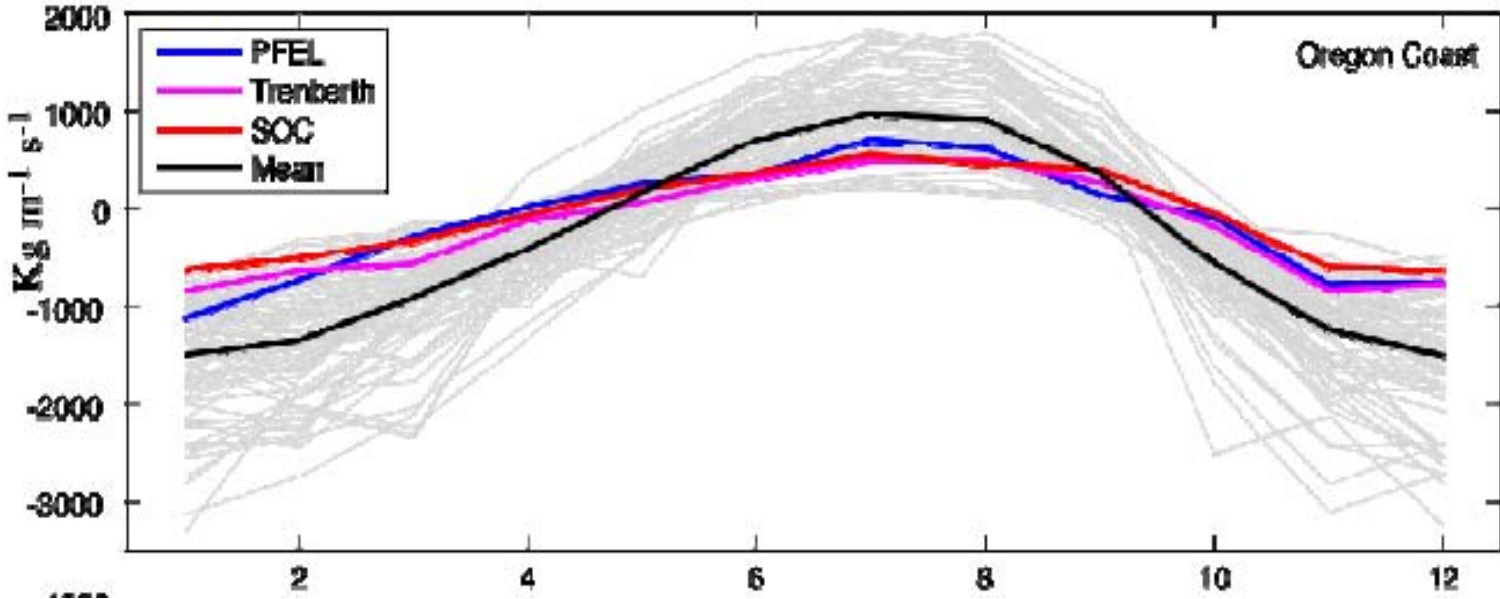
Difference in Sea Level Pressure 2050-2100 Minus 1950-2000

Winds are a factor in second half of century

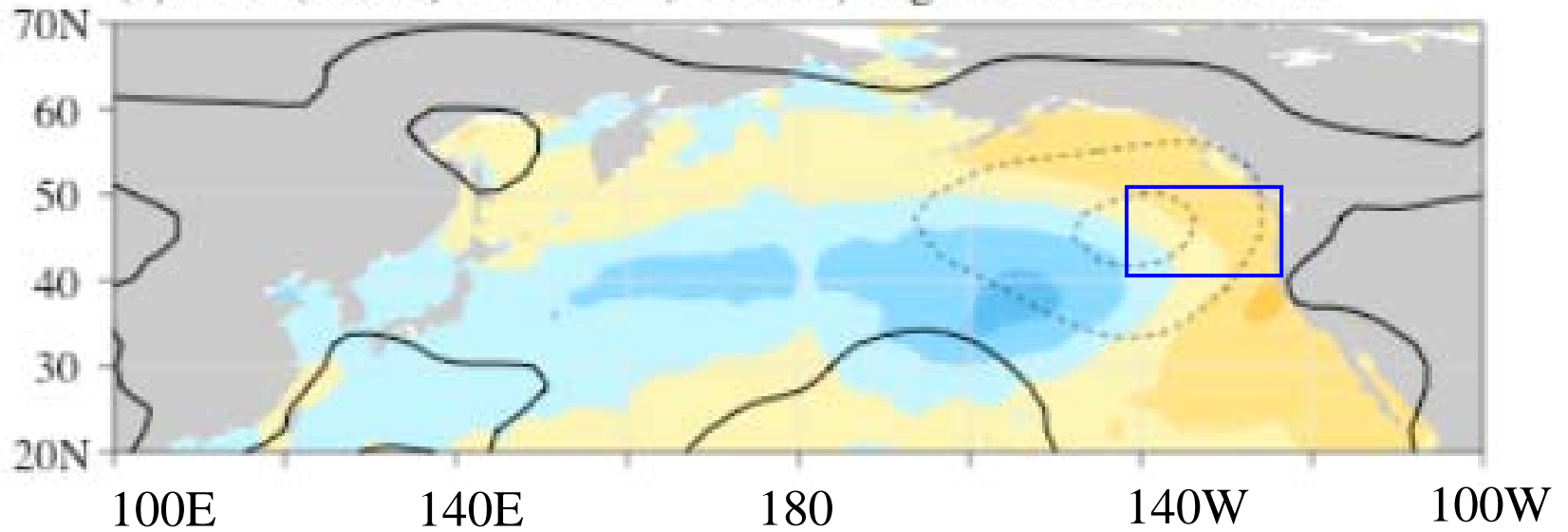


Salathe, 2006

Upwelling Index near Oregon Coast

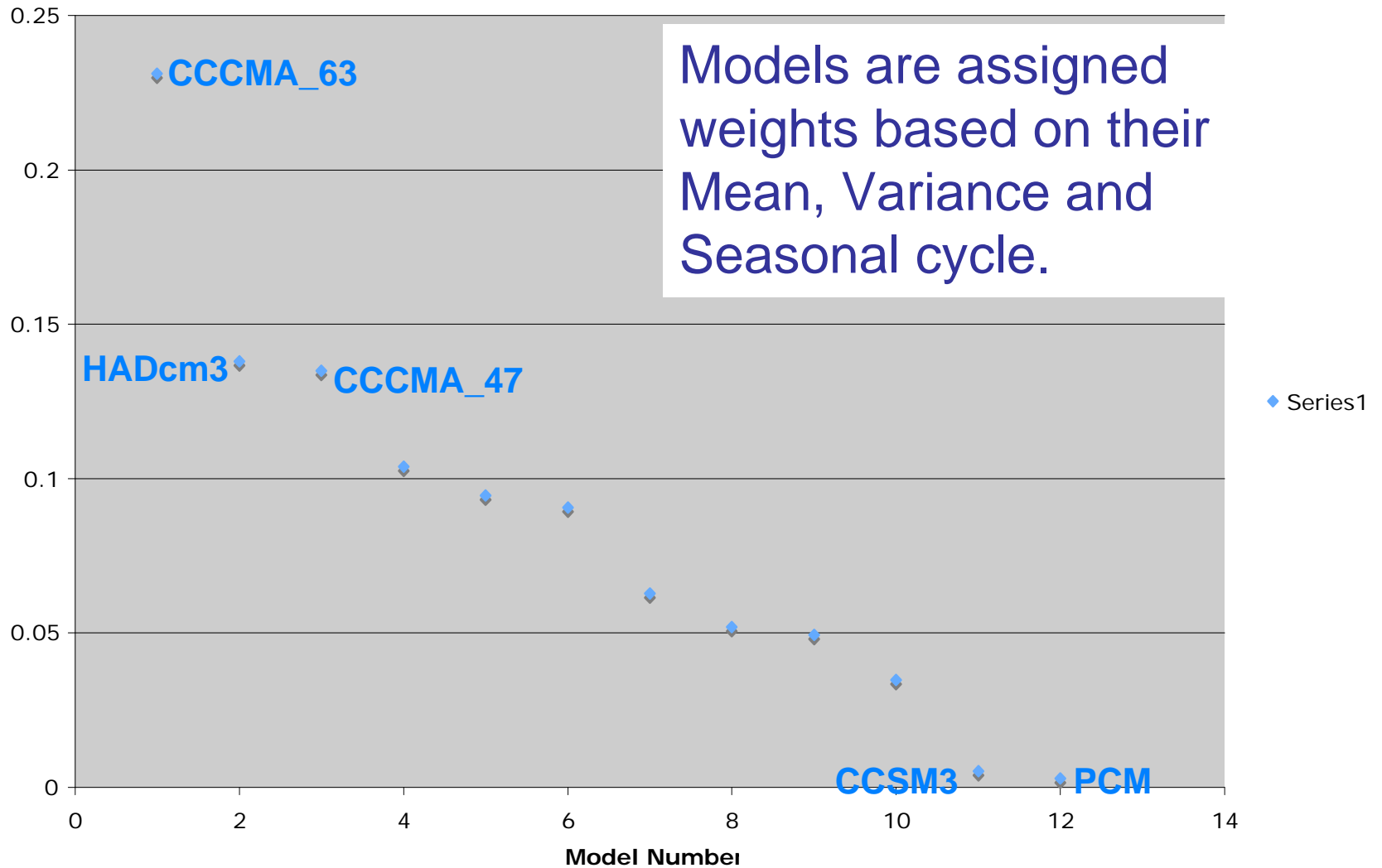


(a) SST (shade) and SLP (contour) regression onto the UI

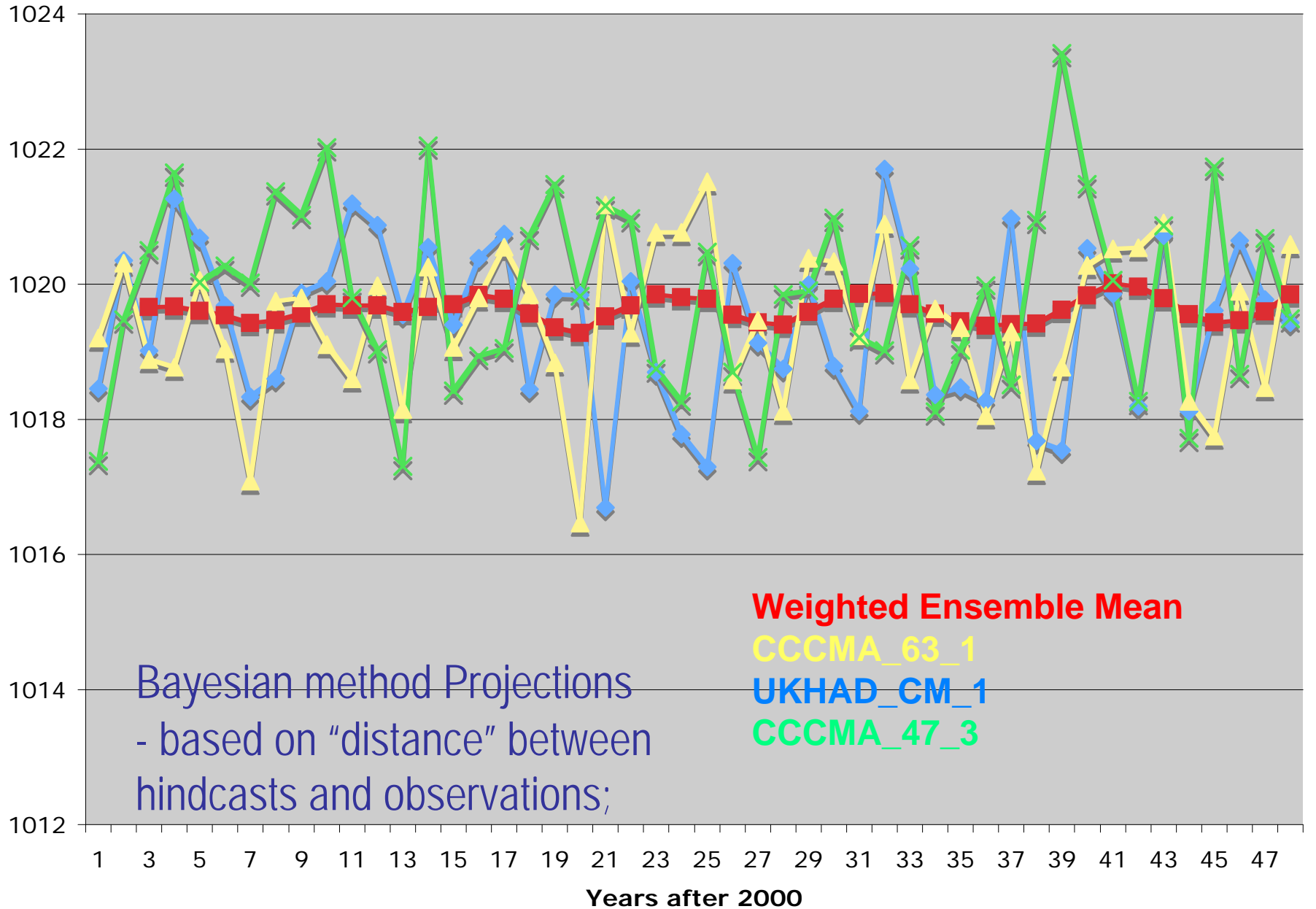


Schwing et al. 2006

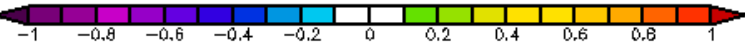
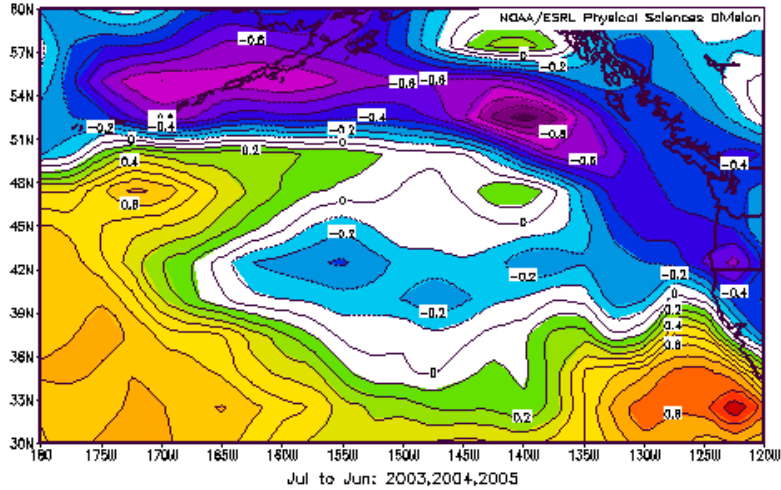
SLP near Oregon Coast



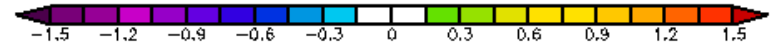
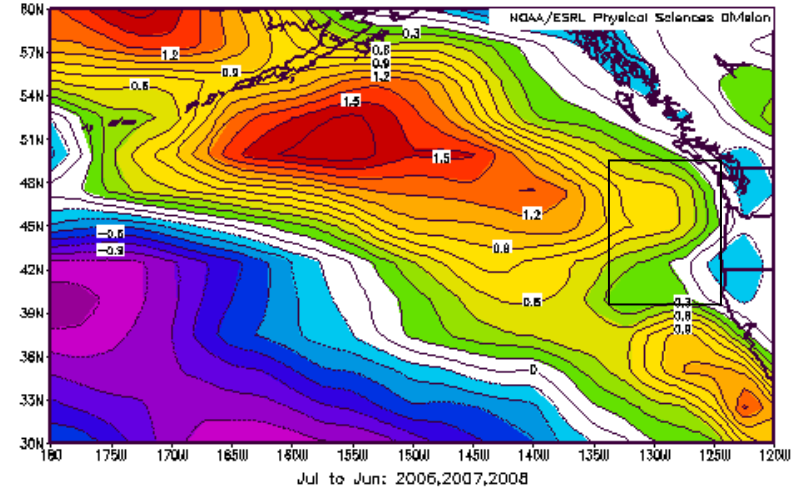
Projected SLP near Oregon Coast



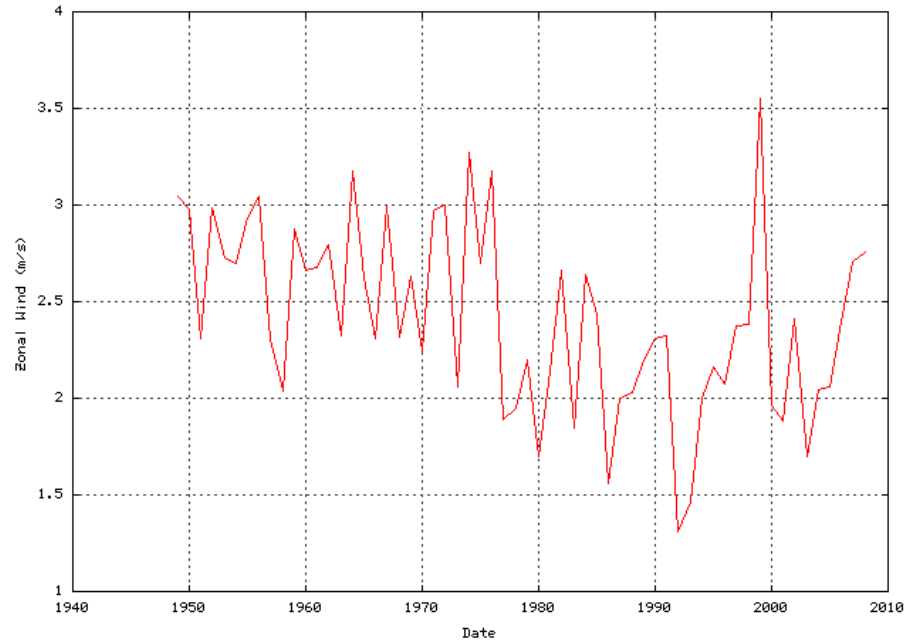
NCEP/NCAR Reanalysis
Surface Zonal Wind (m/s) Composita Anomaly 196B-1996 climo



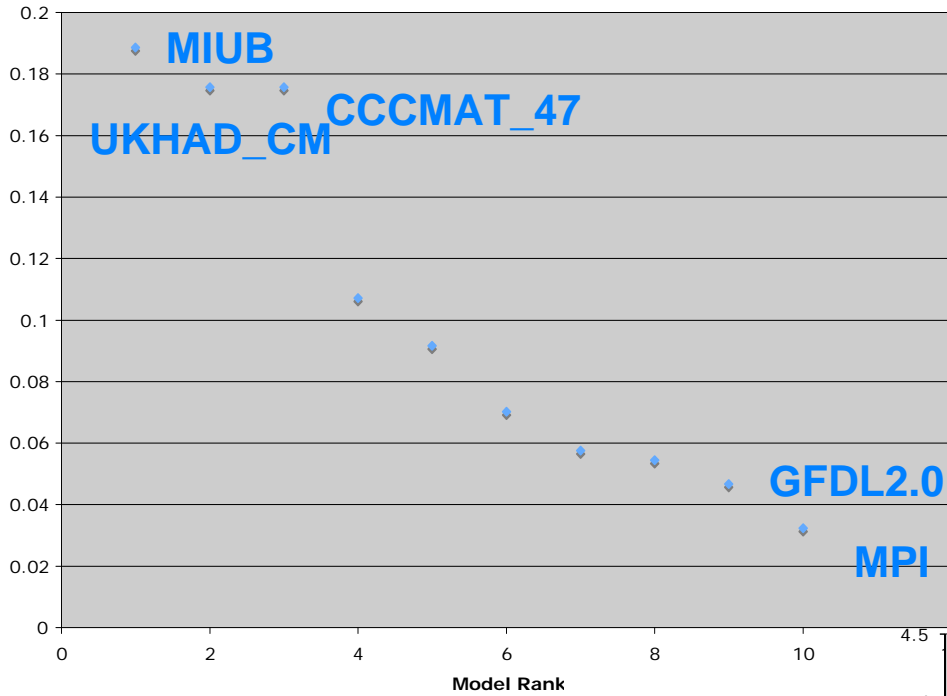
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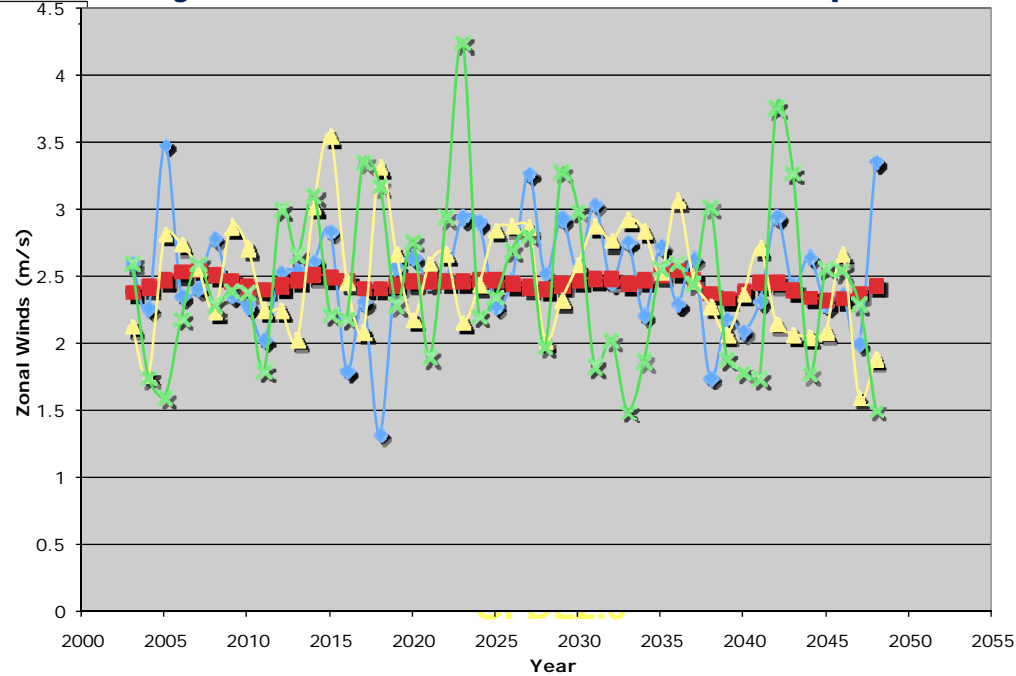
Annual Average Zonal Winds



Model Weight Assigned for Zonal Wind

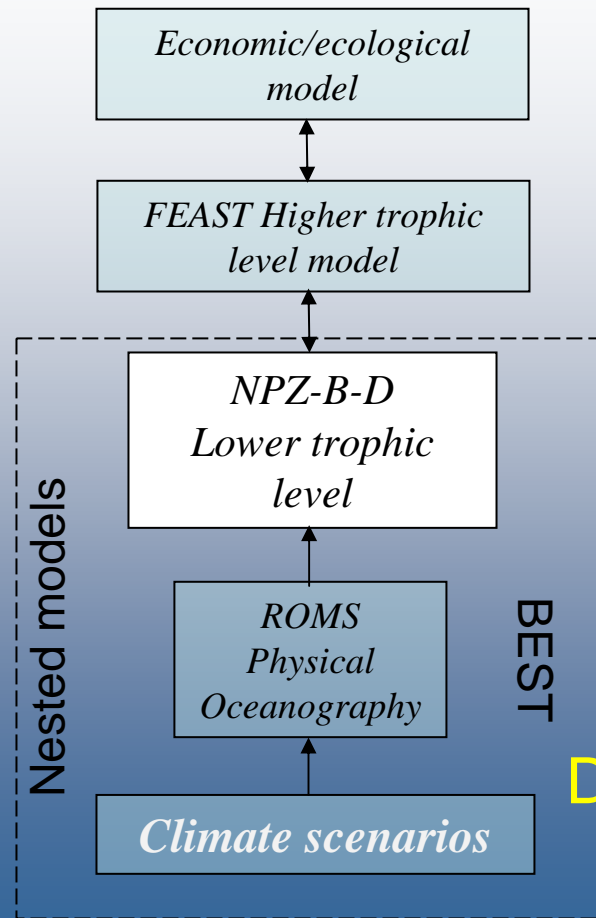


Projected Winds: Ensemble & Examples



Region	Parameter	Purpose
Beaufort Sea	Summer Sea Ice	Polar Bears
Bering Shelf	Spring Winds	Flatfish
Bering Shelf	Summer SST	Lower - trophic Levels
Bering Shelf	Winter/Spring Sea Ice	Seal Pollock Whales
West Alaska	Spring SAT	Chum Salmon
Unimak Pass	Winter - Spring Winds	Chum Salmon
Shelikof Strait	Spring Winds SST	Pollock
Kodiak Isl and	Winter - Spring Precip	Pollock
East China Sea	Winter - Spring Winds	Mackerel
NW Hawaii	Summer SST	Coral Reef Health
Oregon Coast	Summer Upwelling	Lower - trophic Levels
Morocco Coast	Summer Upwellin g	Lower - trophic Levels
Peru Coast	Summer Upwelling	Lower - trophic Levels
NE Pacific	Zonal Wind s	Zooplankton
Barents Sea	Bott om Temp	Cod
North Sea	Bott om Temp	Cod
Arctic Land	SAT	Variability Mech anisms
N Pacif ic	SST	Past & Future Changes
Kuroshio	Winds	IPCC m odel tests
Gulf Stream	Winds	IPCC m odel tests
Pacific NW	SST/ SAT/ T850	Future Trends
Japan Sea	SST	Future Trends

BSIERP Integrated modeling



Dynamical Downscaling

UNDERSTANDING ECOSYSTEM PROCESSES IN THE

Bering Sea

