Variability of coastal and open ocean habitats of Sei Whales in the western North Pacific using multi-sensor remote sensing

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CONTENTS

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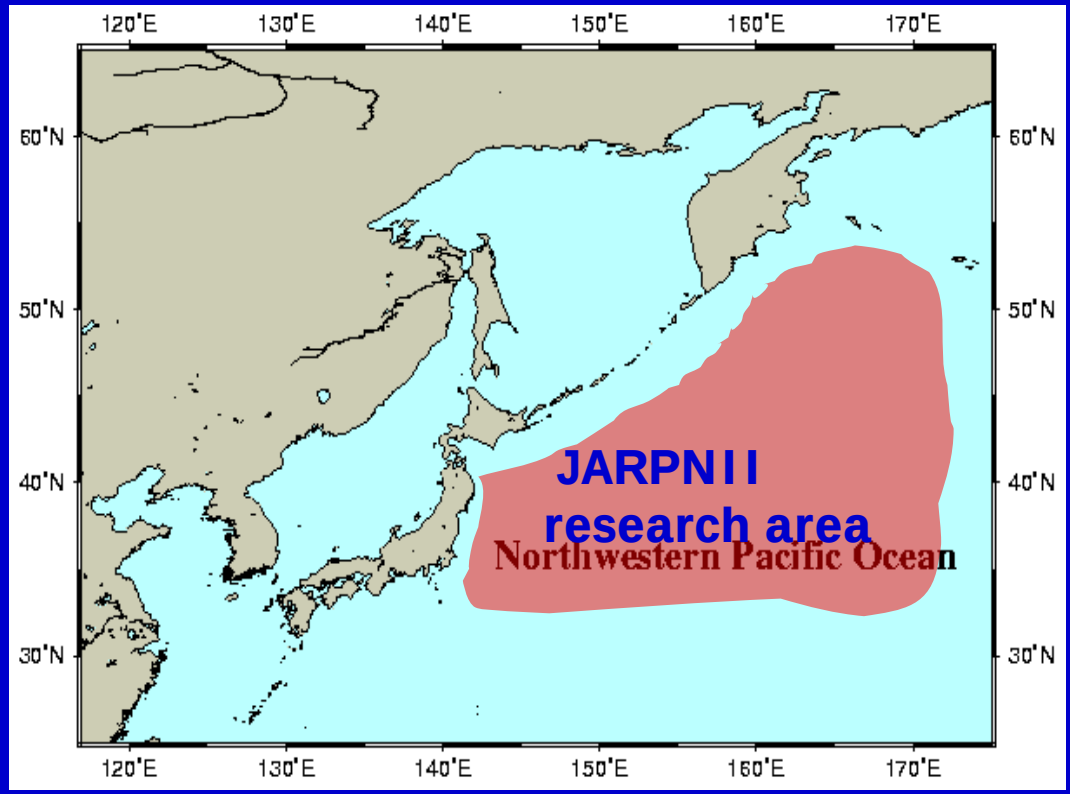
1.Background

Relationship between Whales and oceanic conditions

- gradient of water temperature
- boundary where warm water meets cold water
- eddies along frontal zone
- bathymetry feature

(e.g. Uda, 1954 ; Nasu, 1960)

1.Background



The Japanese Whale Research Program under Special Permit in the Western North Pacific (JARPN/JARPNII)

ecosystem studies, feeding ecology

||

competition between whales and fisheries

Why Sei Whales ?

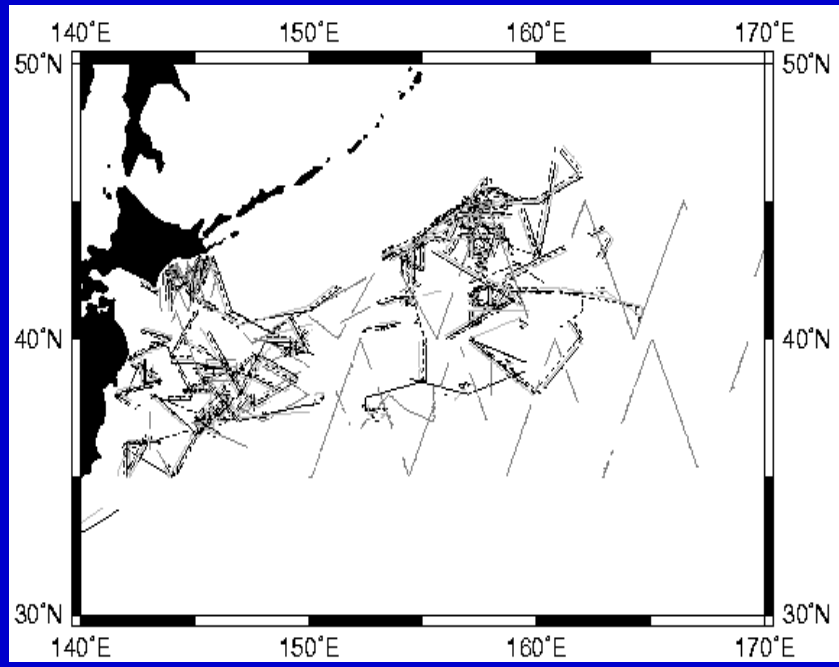
(http://atelierjam.hp.infoseek.co.jp/imghtml/sei)

- High abundance
- Sensitive to oceanographic features

past observation methods
shipboard survey

limitation in monitoring

ocean environmental change in vast area



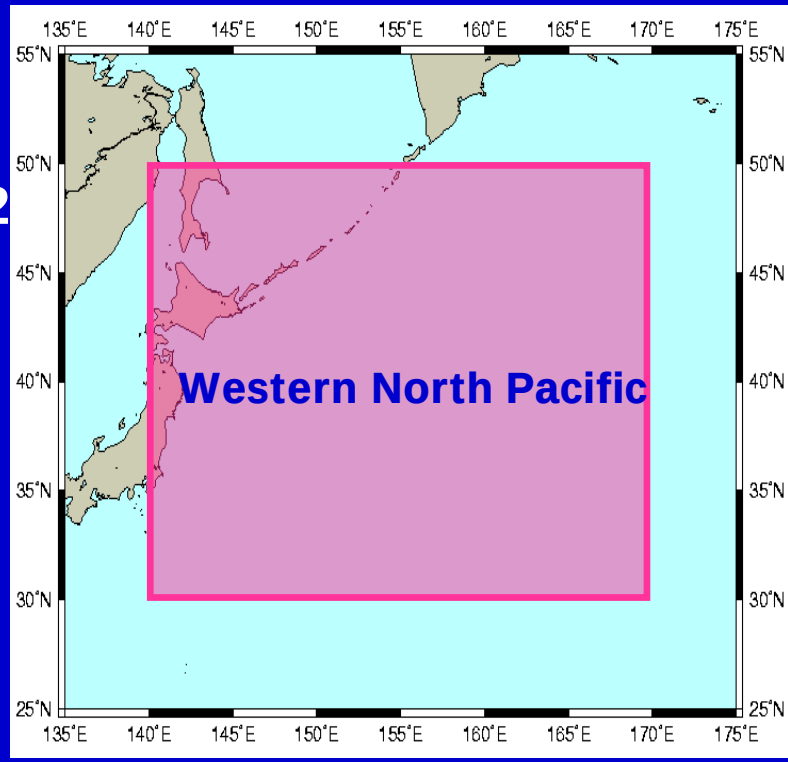
sighting survey effort in 2001, 2002 JARPN2

objective

To investigate relationship between Sei Whales and oceanographic environment using multi-sensor remote sensing

2.Data and Methods

Study area
30°N~50°N,140°E~170°E



In situ data

JARPNII survey 5/10-8/4, 2001, 6/5-9/18, 2002

- sighting surveys
  sighting position of Sei Whales
- oceanography observations
  sea surface temperature & salinity

Satellite data

May-September, 2001-2002

- sea surface temperature (SST) : NOAA/AVHRR
- chlorophyll *a* (chl-a) : Orbview-2/SeaWiFS

} monthly data

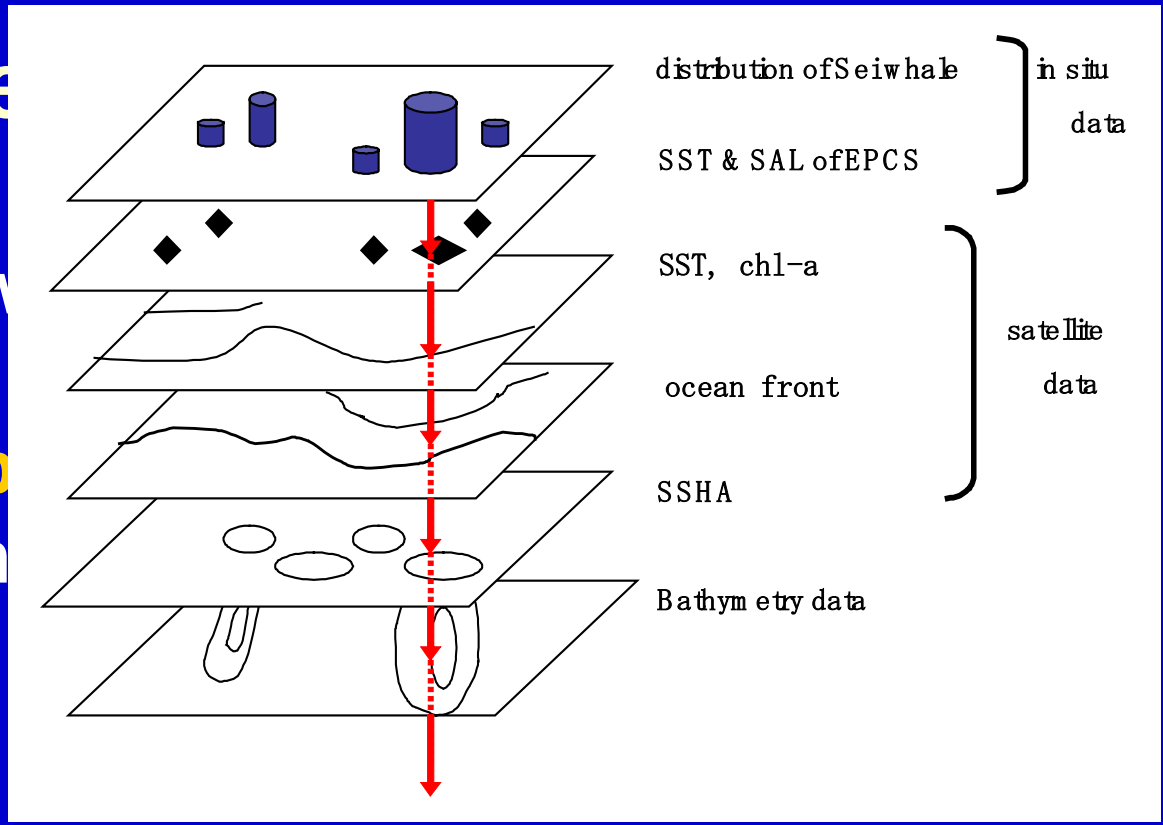
Bathymetry data

: ETOPO5 data provided by NESDIS/NGDC

2.Data and Me

Ocean fronts : tw

determine the ap
statistically from

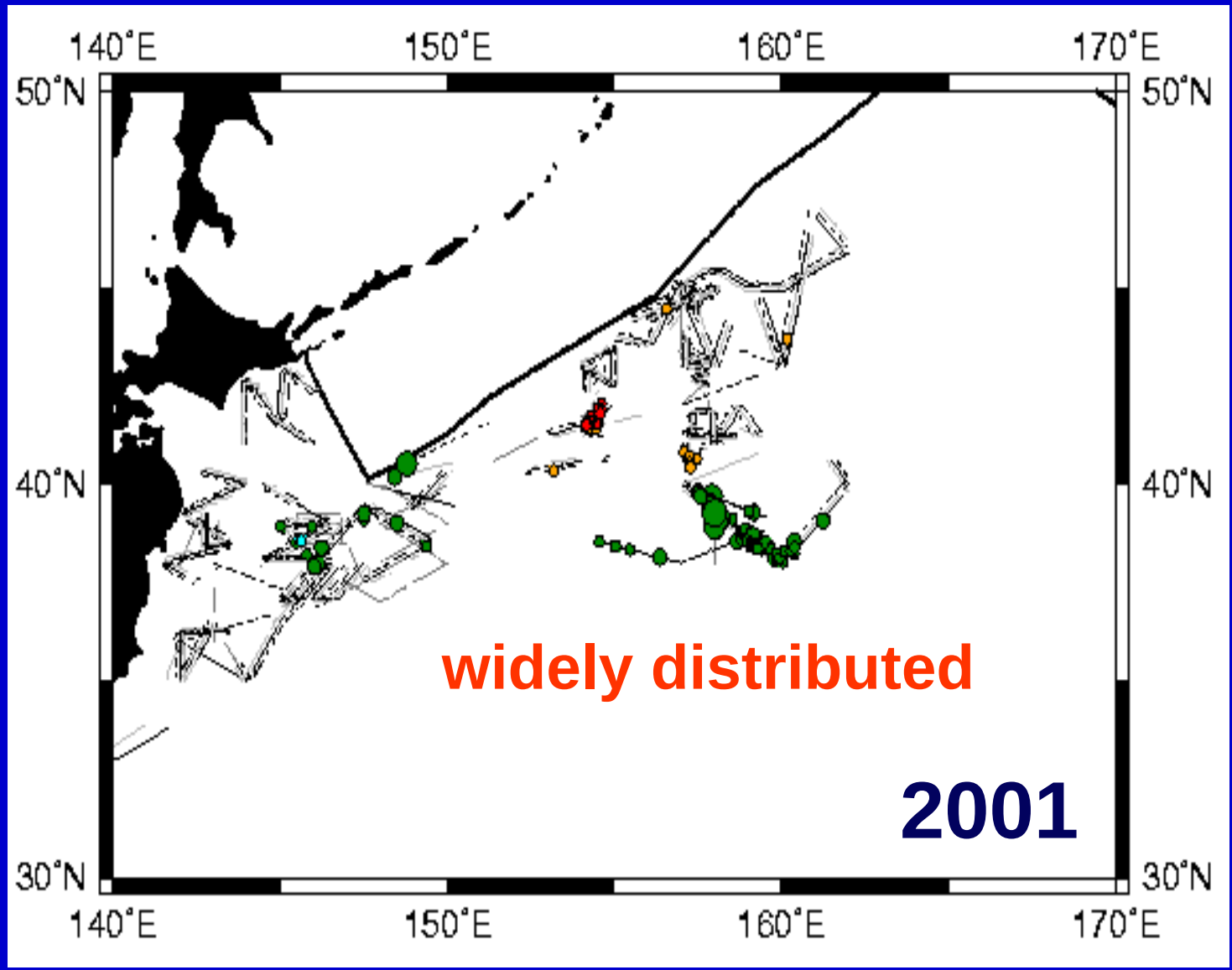


front map

- Oyashio/Kuroshio fronts (AVHRR-SST)
- chl-*a* front (SeaWIFS-chl-*a*)

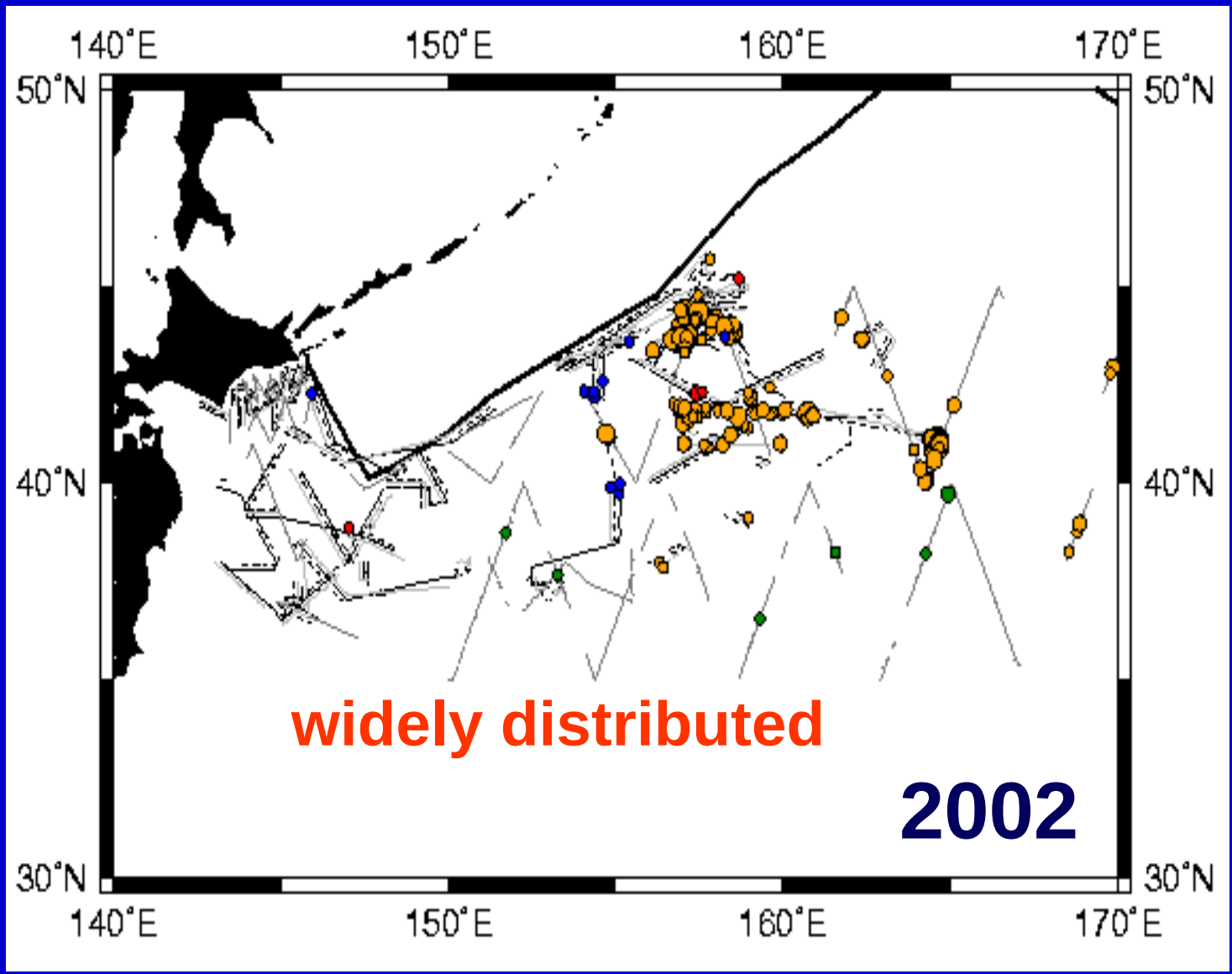
3. Result and Discussion

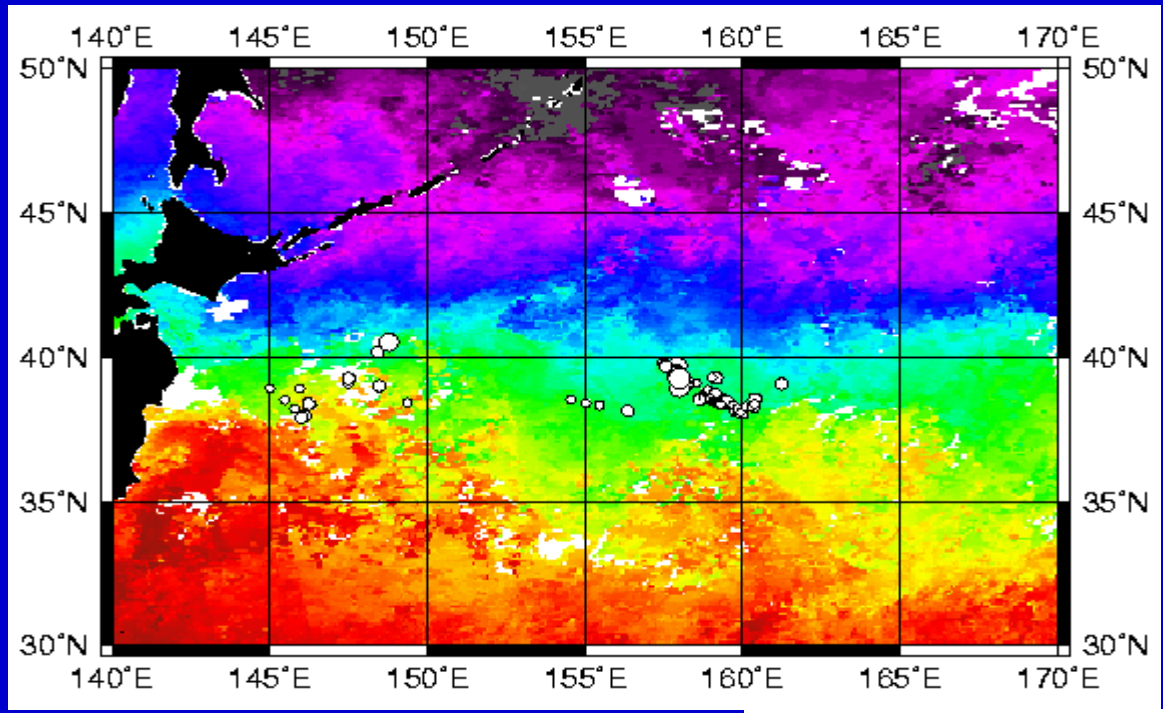
sighting survey effort & sighting position of Sei Whales



3. Result and Discussion

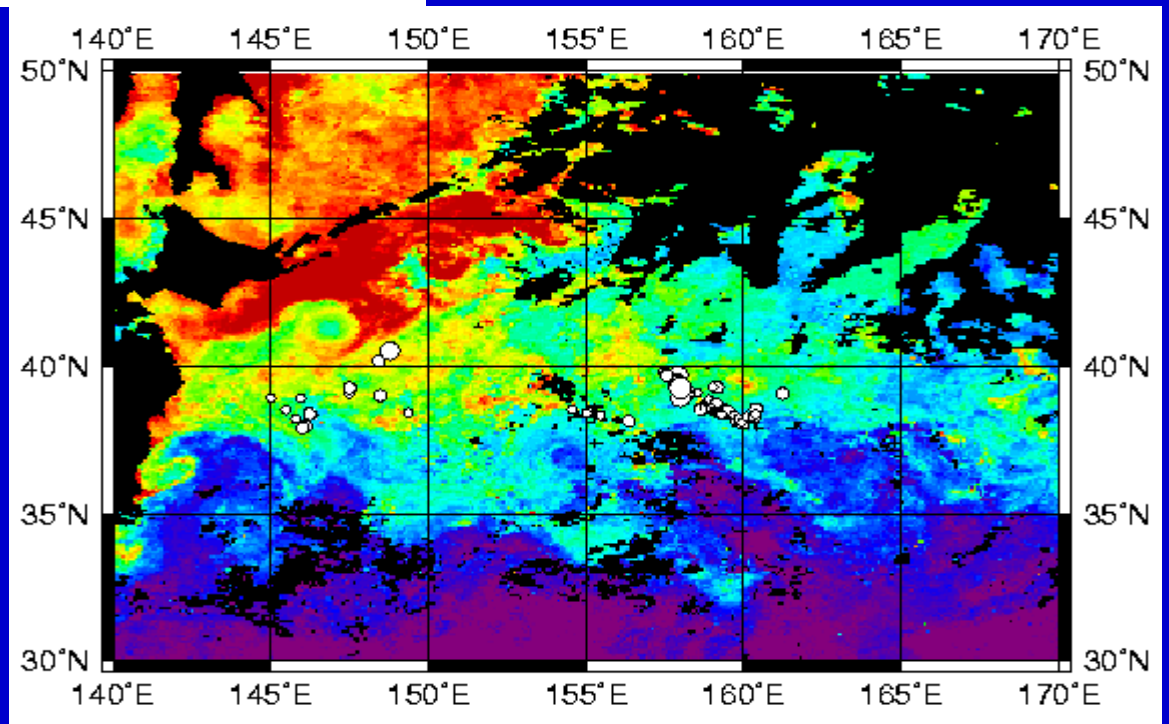
sighting survey effort & sighting position of Sei Whales



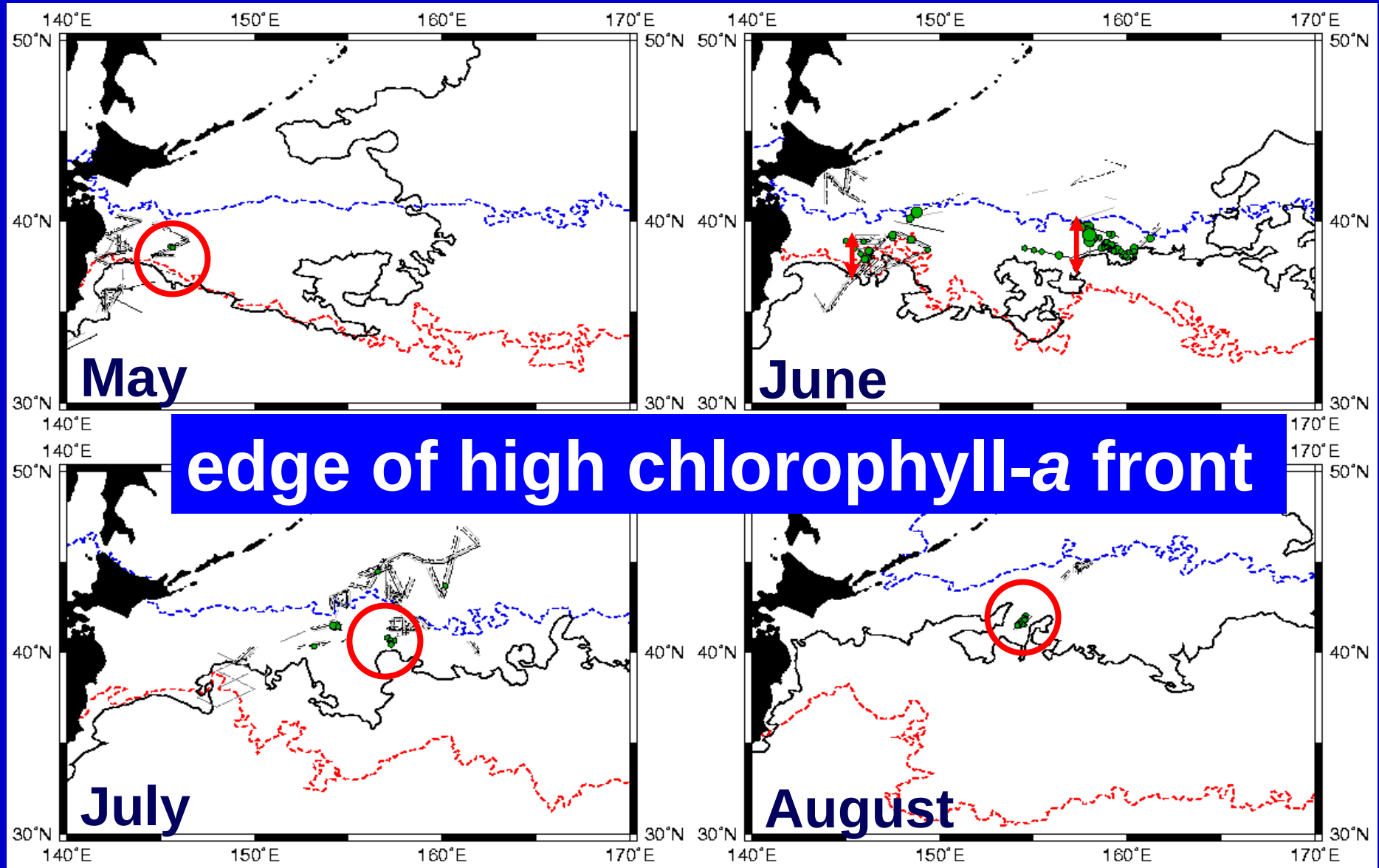


AVHRR SST image in June, 2001

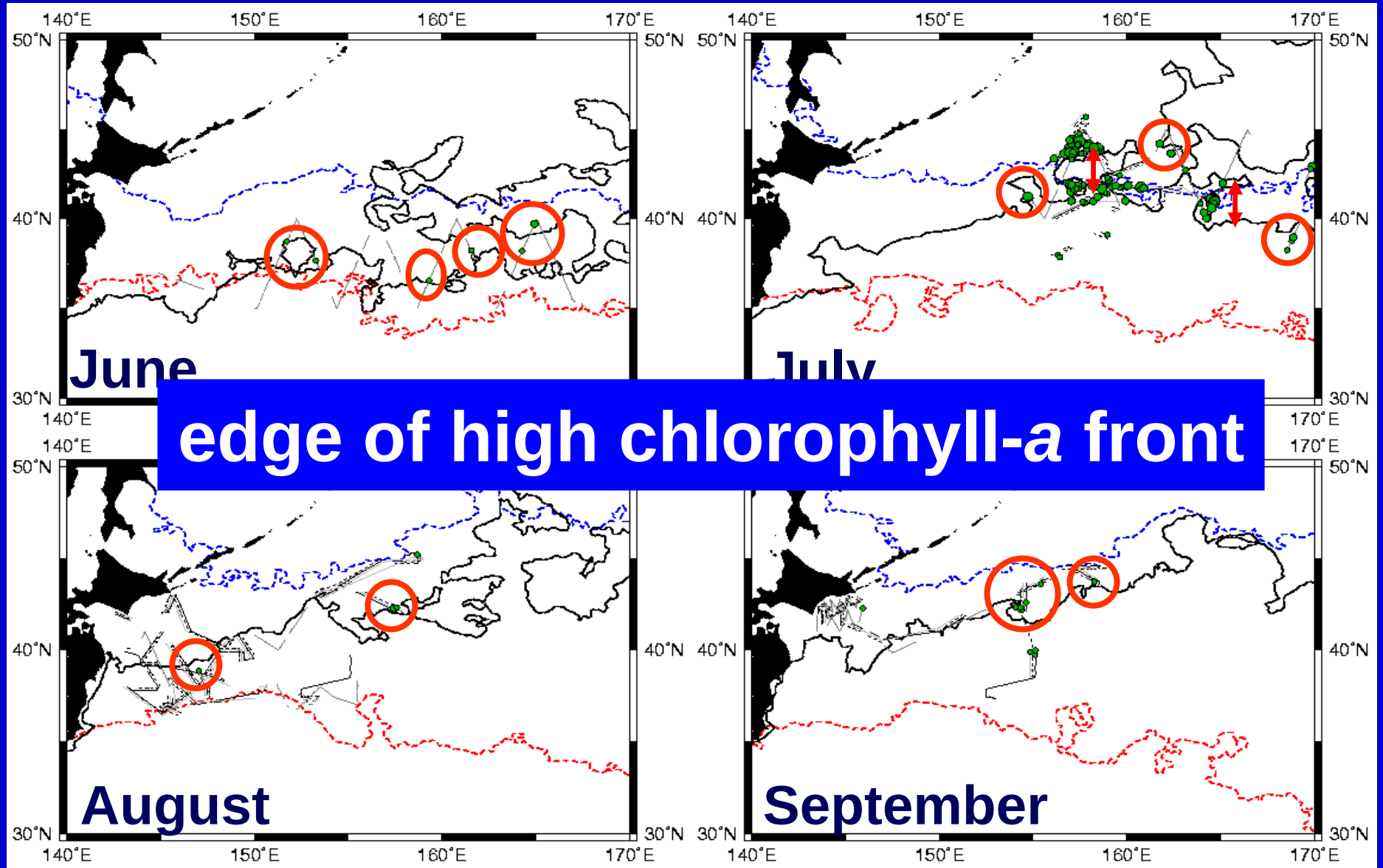
SeaWiFS chl-*a* image in June, 2001

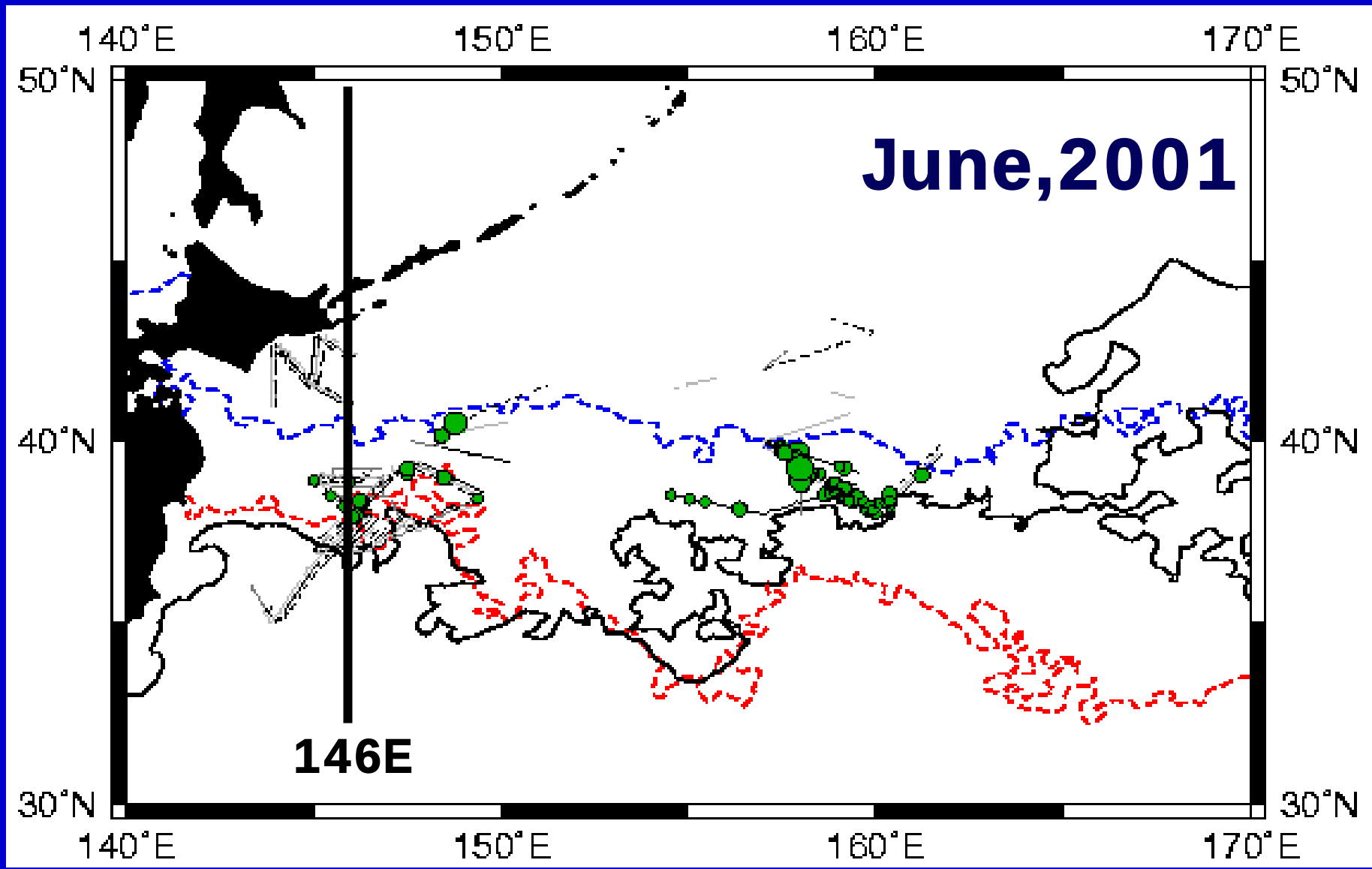


Ocean fronts map in 2001



Ocean fronts map in 2002

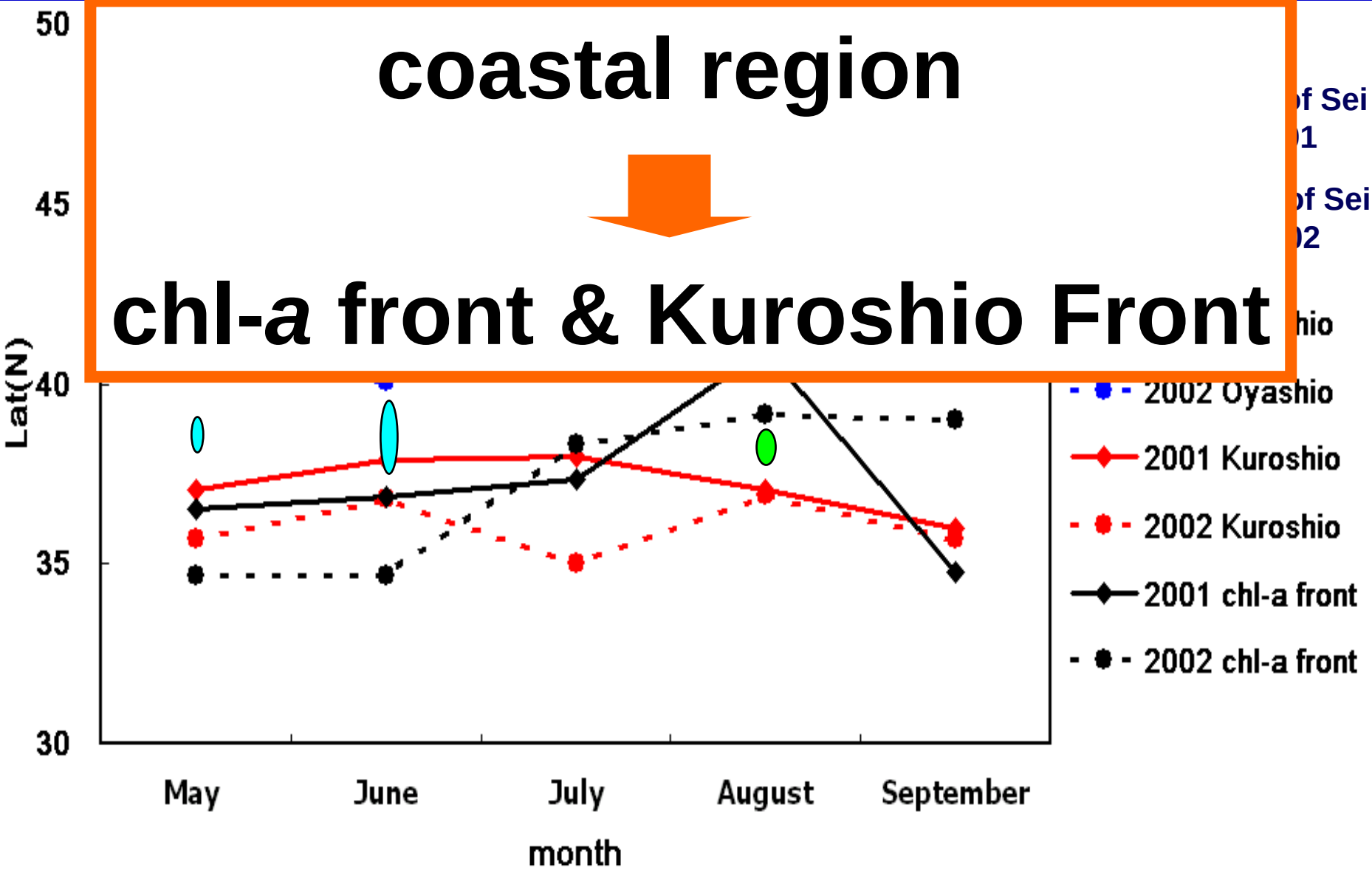


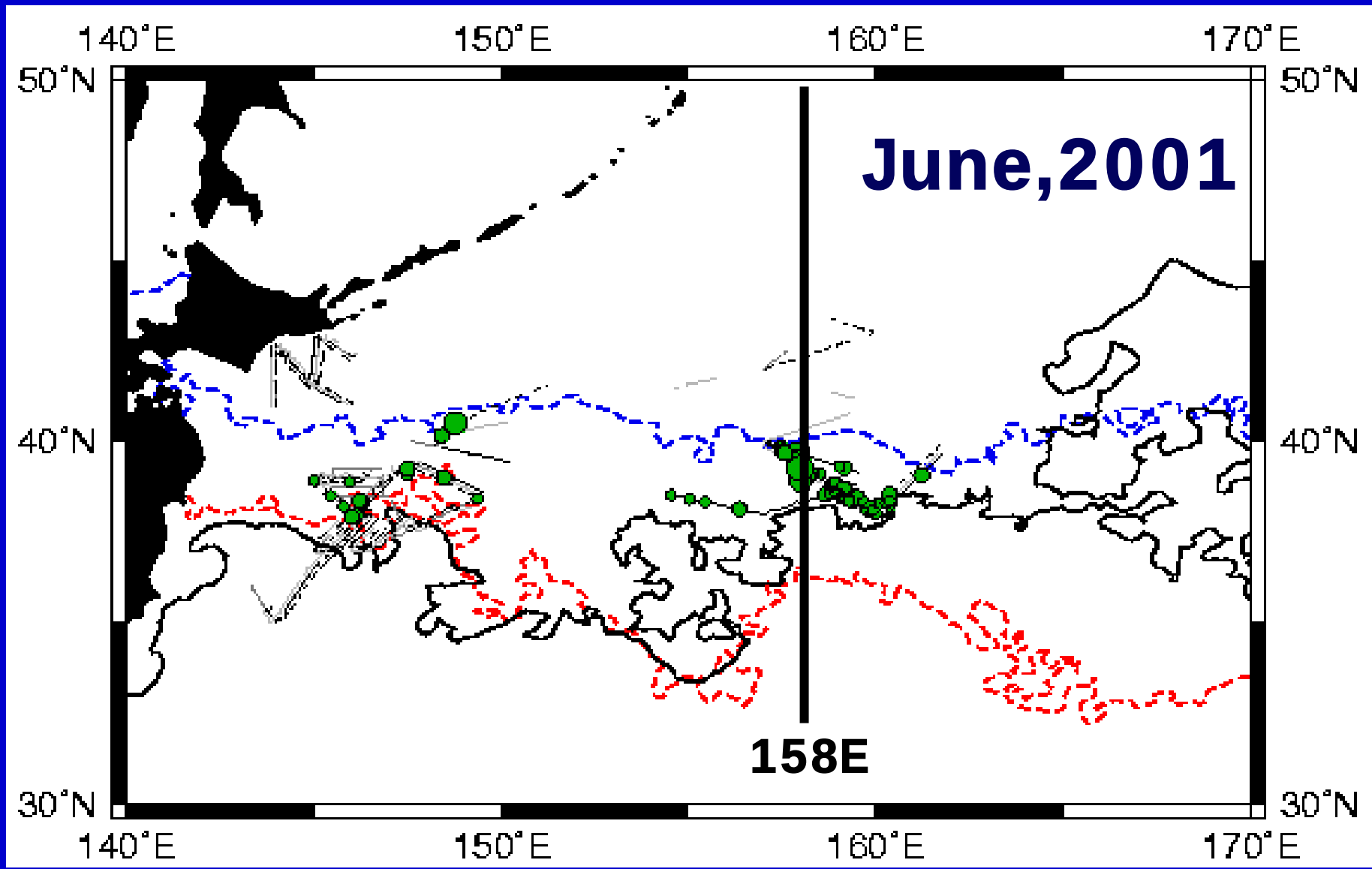

140°E
150°E
160°E
170°E
50°N
40°N
30°N
June,2001
146E

Ocean fronts : latitude along 146E

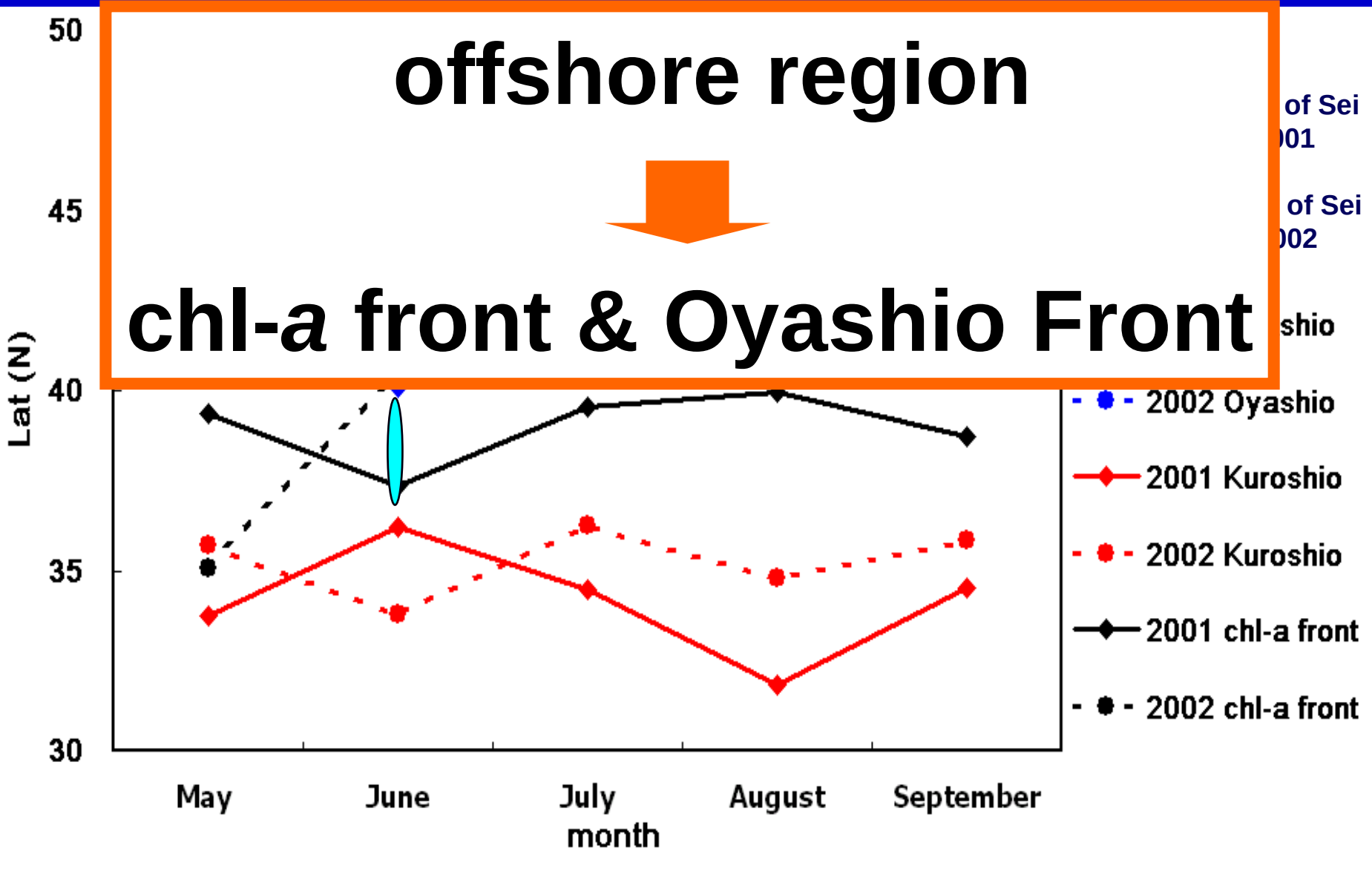
coastal region

chl-*a* front & Kuroshio Front

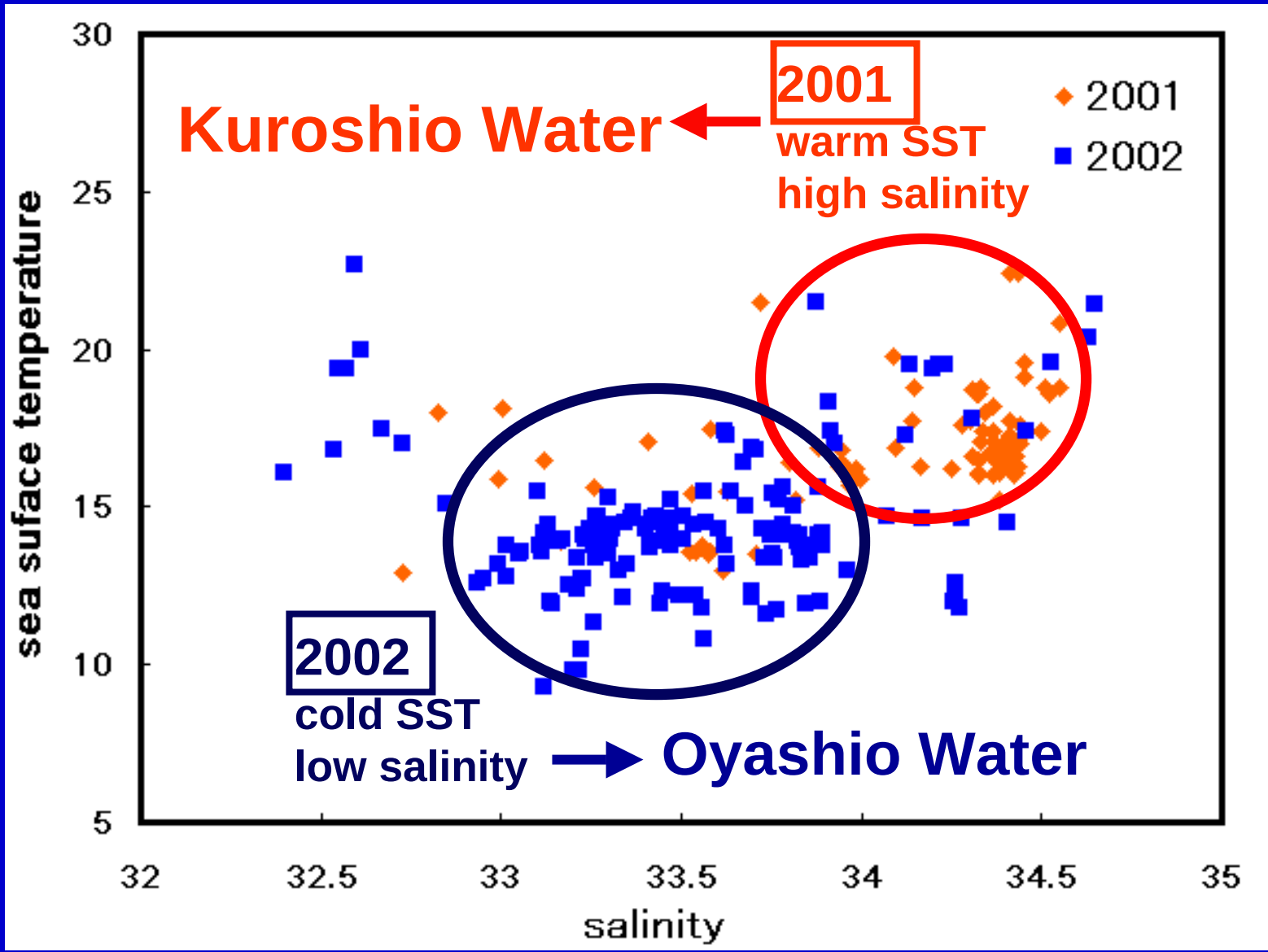



140°E
150°E
160°E
170°E
50°N
40°N
30°N
June,2001
158E

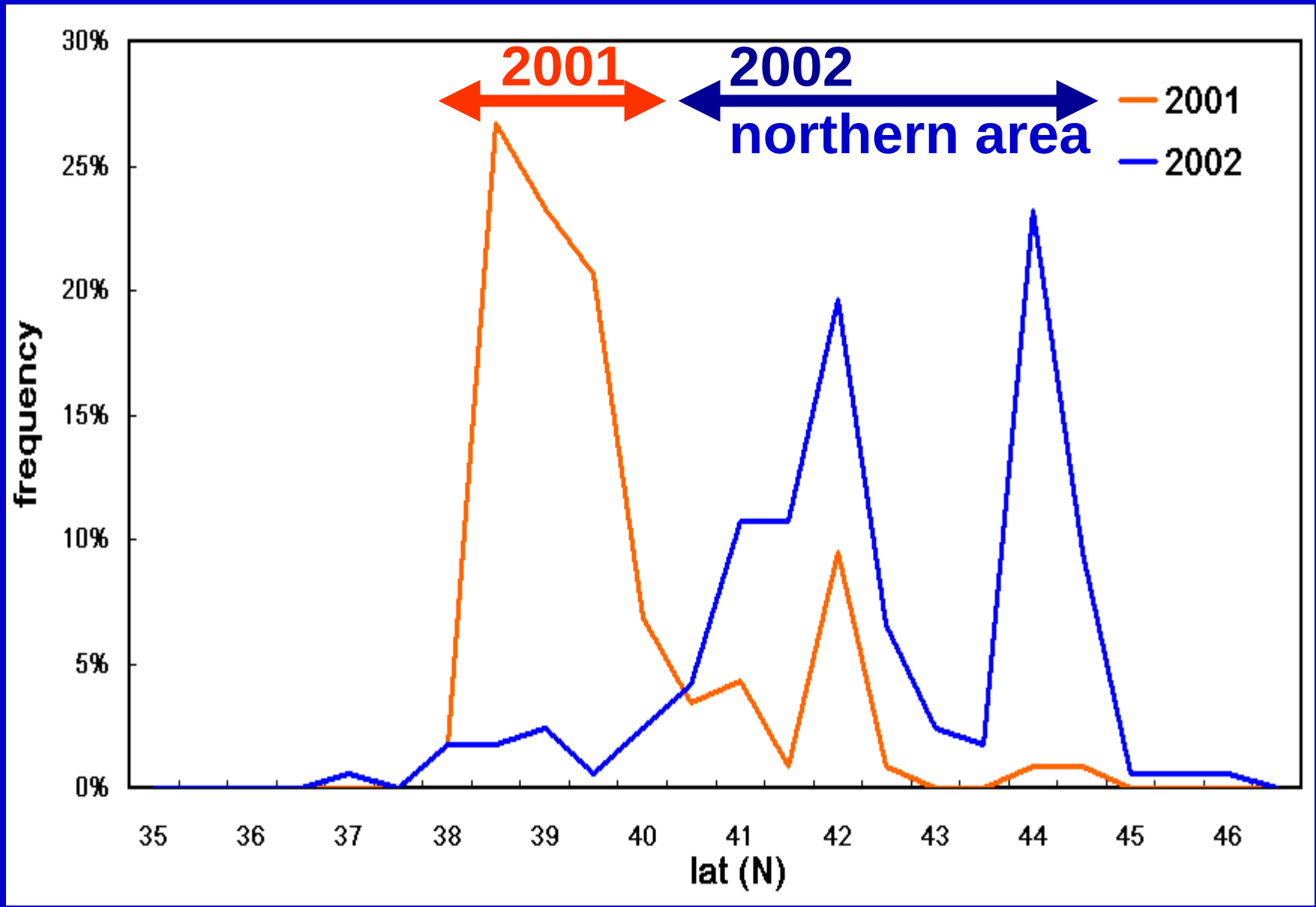
Ocean fronts : latitude along 158E



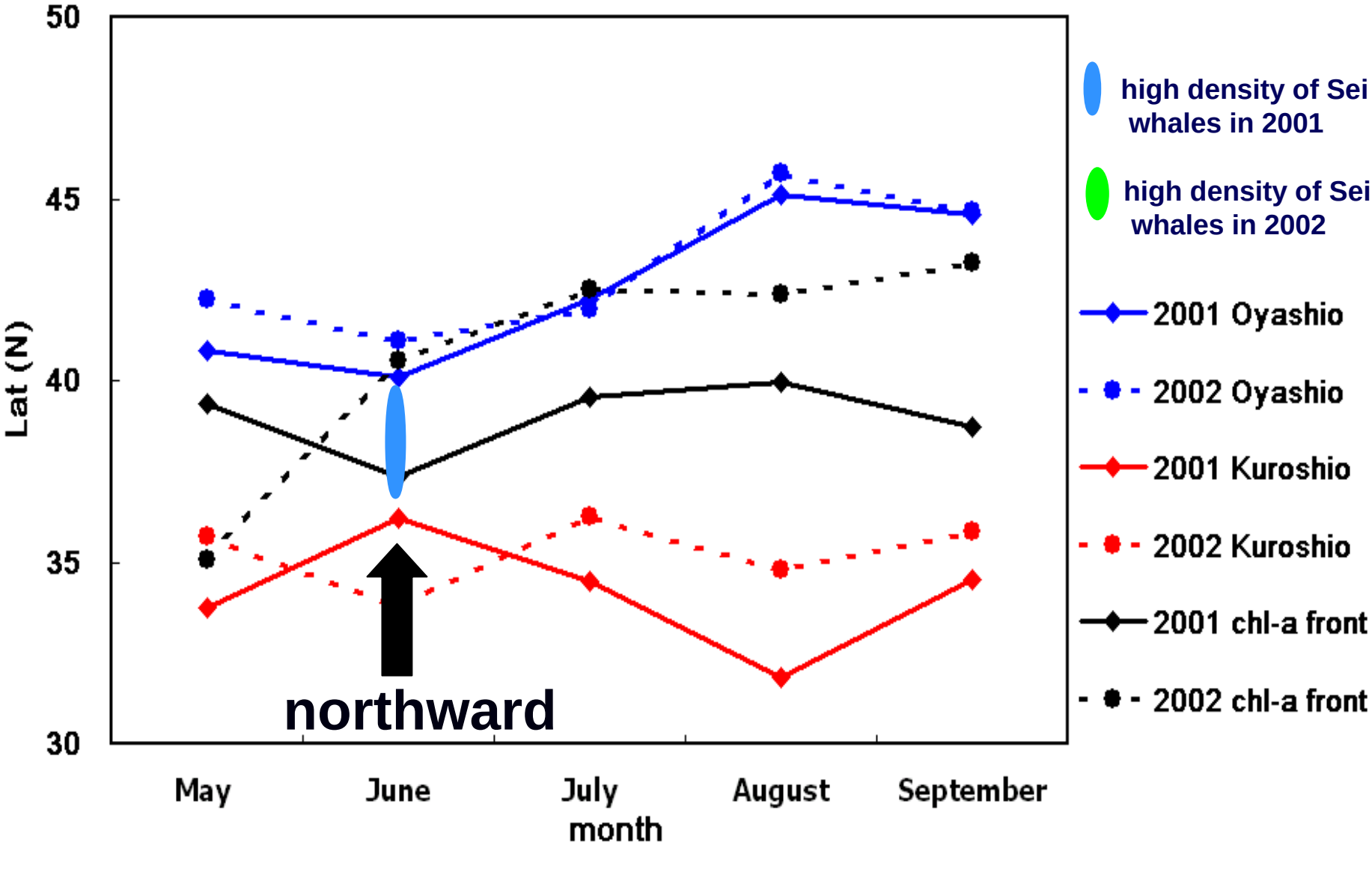
sst-salinity of sighting position scattergram



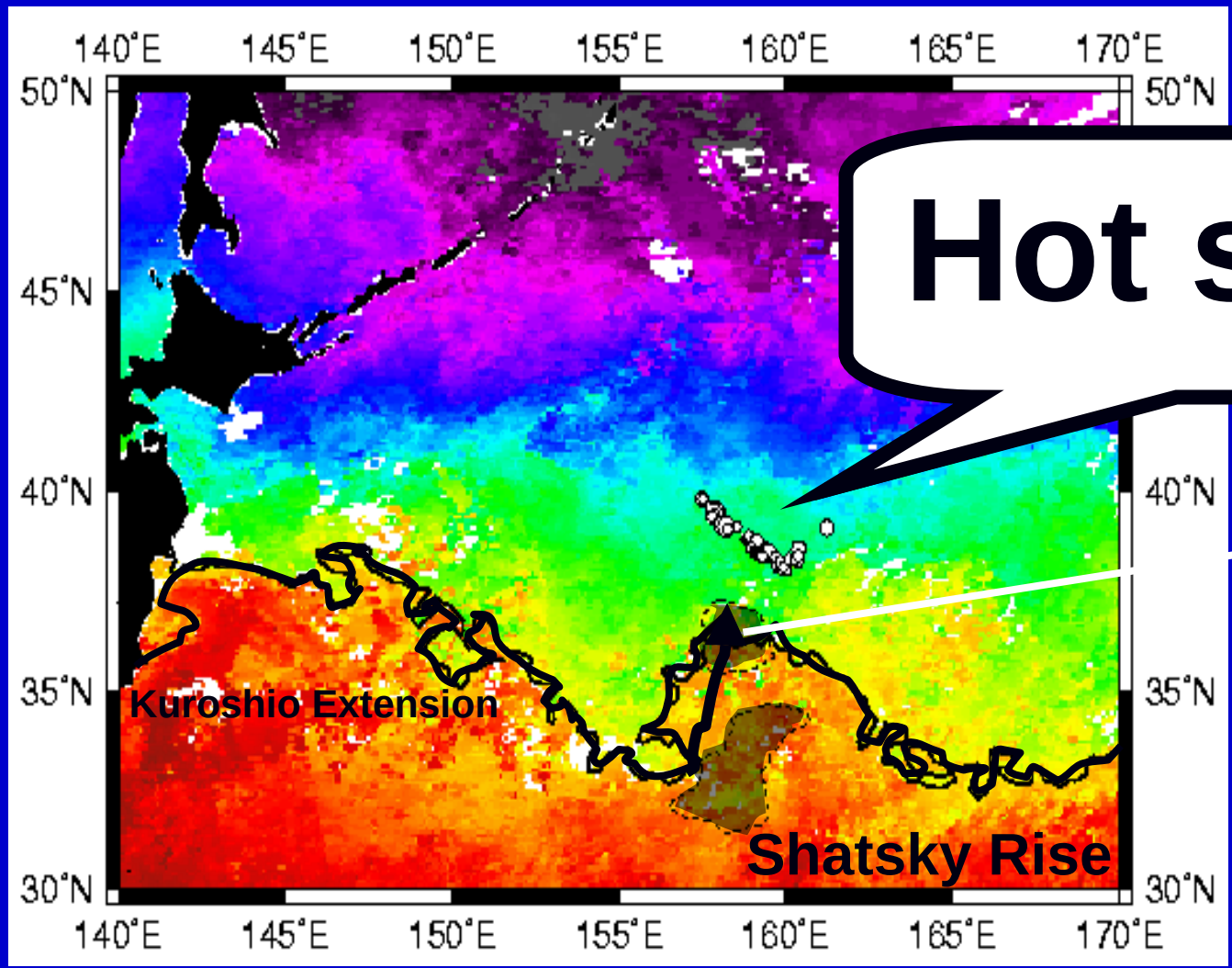
latitude of sei whales sighting position



ocean fronts : latitude along 158E



offshore region in 2001



migration route

epipelagic fishes
(Komatsu et al.,2002)

SST monthly image in June 2001

4.Conclusion

- **Sei Whales was observed the higher productivity area where was the edge of high chlorophyll-*a* front**

- **There was interannual variability in 2001/2002, due to difference of ocean fronts dynamics**