A preoperational ocean forecasting systems for Chinese Waters

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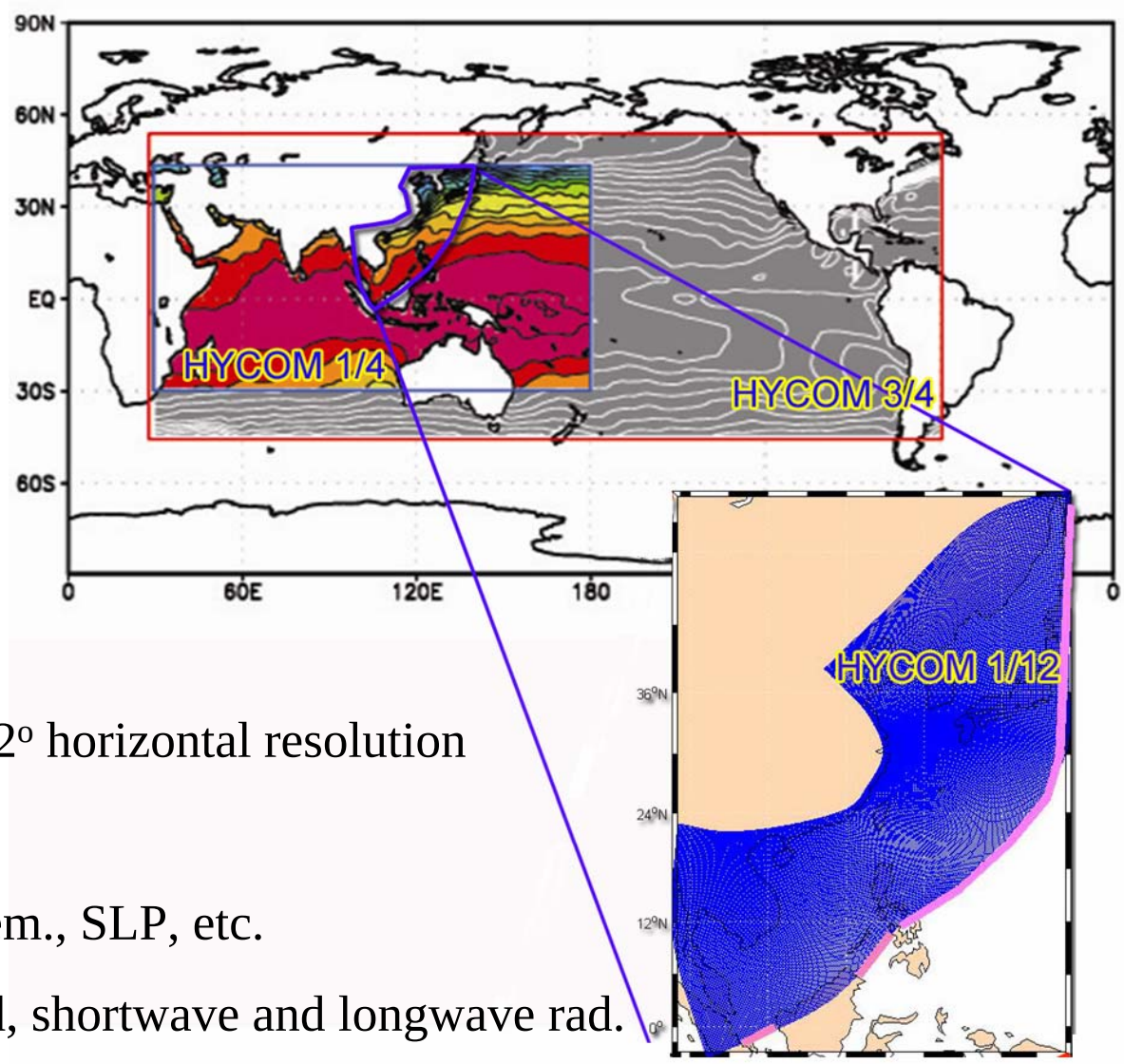
Model



Model: HYCOM V2.1.03

Nesting: Yes

Resolution: 22 layers, 1/8^{o}-1/12^{o} horizontal resolution

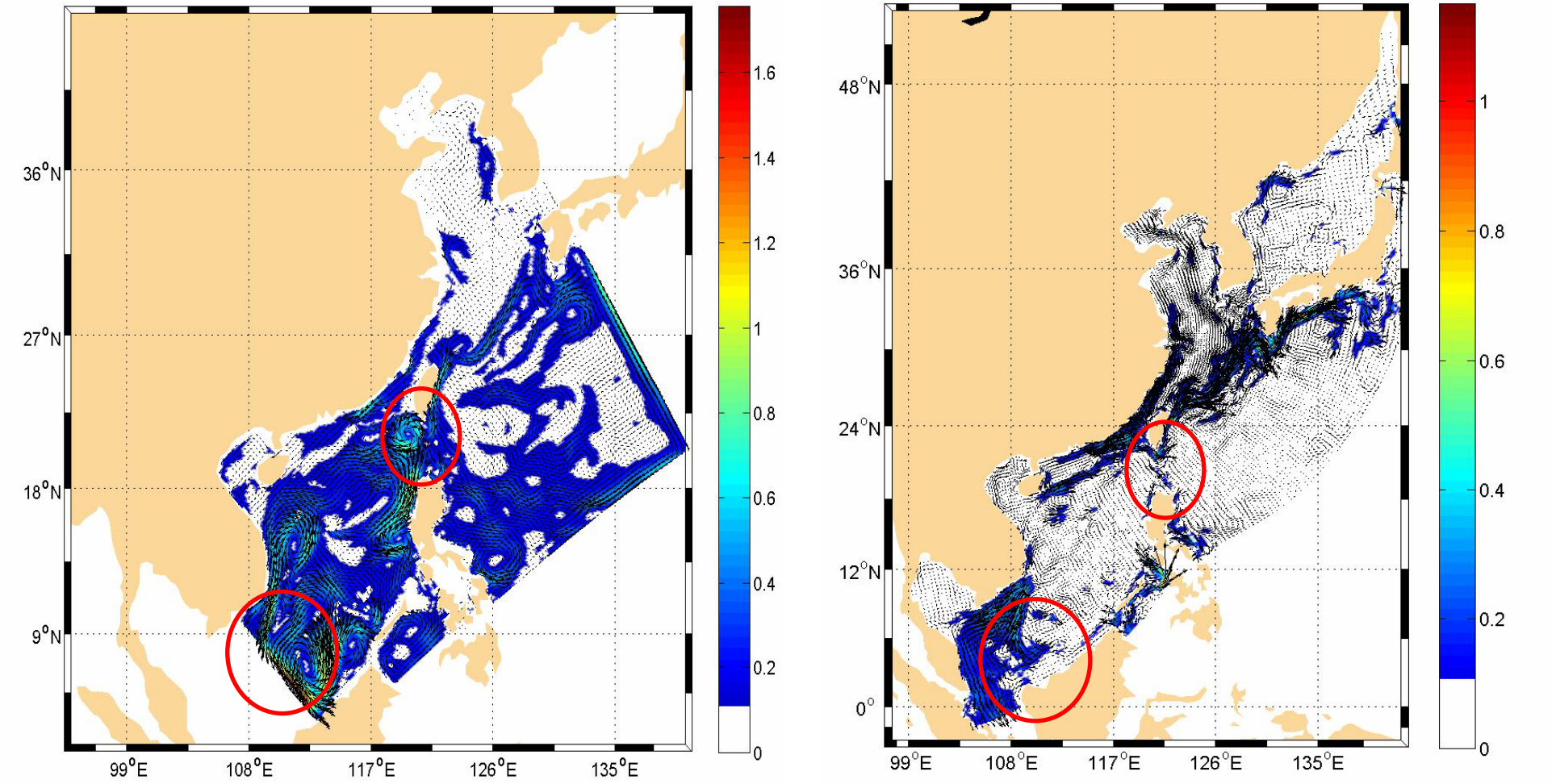
Running: 1993-2005

ECMWF: 6-hourly wind, air tem., SLP, etc.

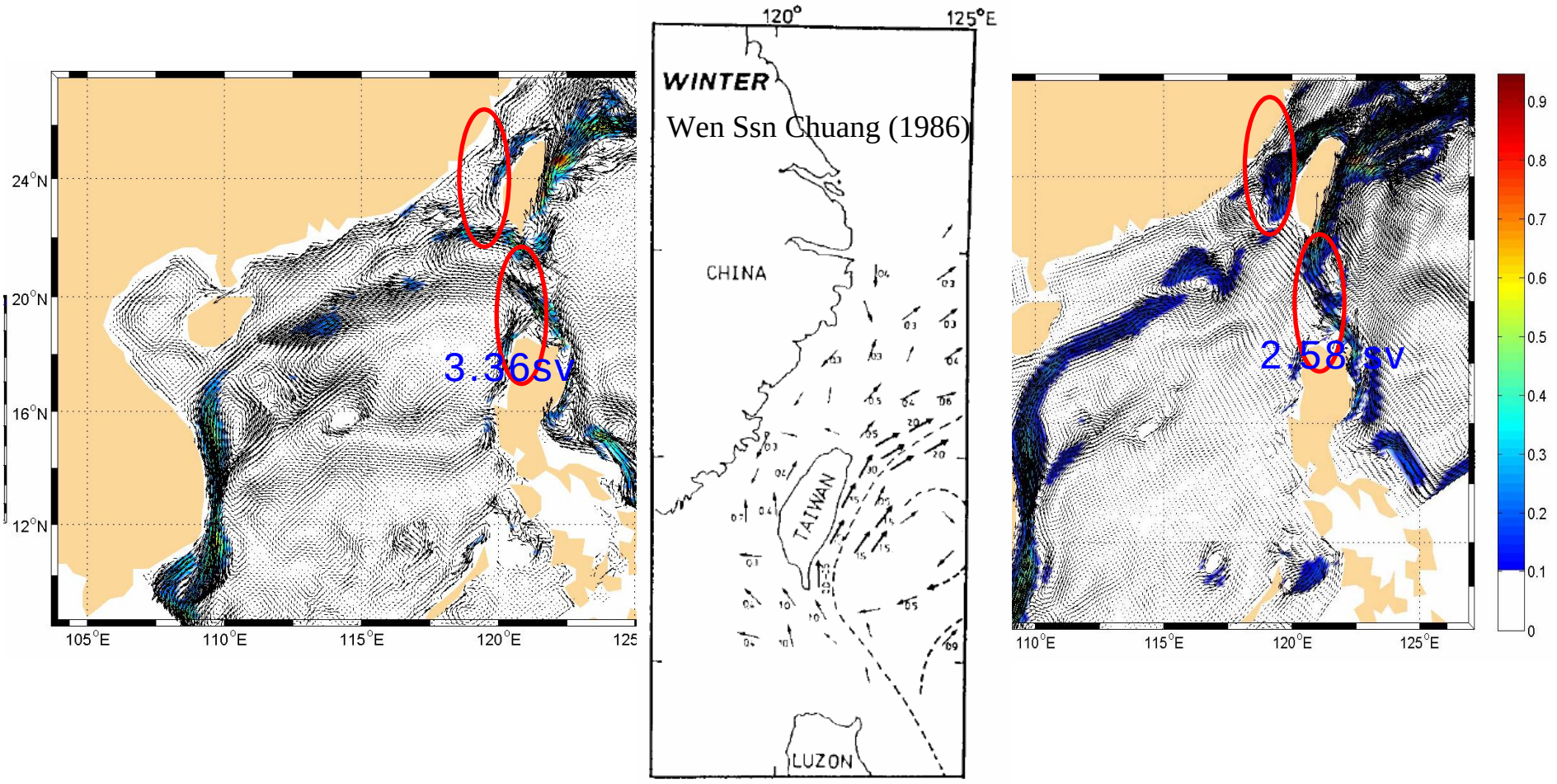
COADS: Climatology of cloud, shortwave and longwave rad.

Legates and Willmott (1990) climatology precipitation.

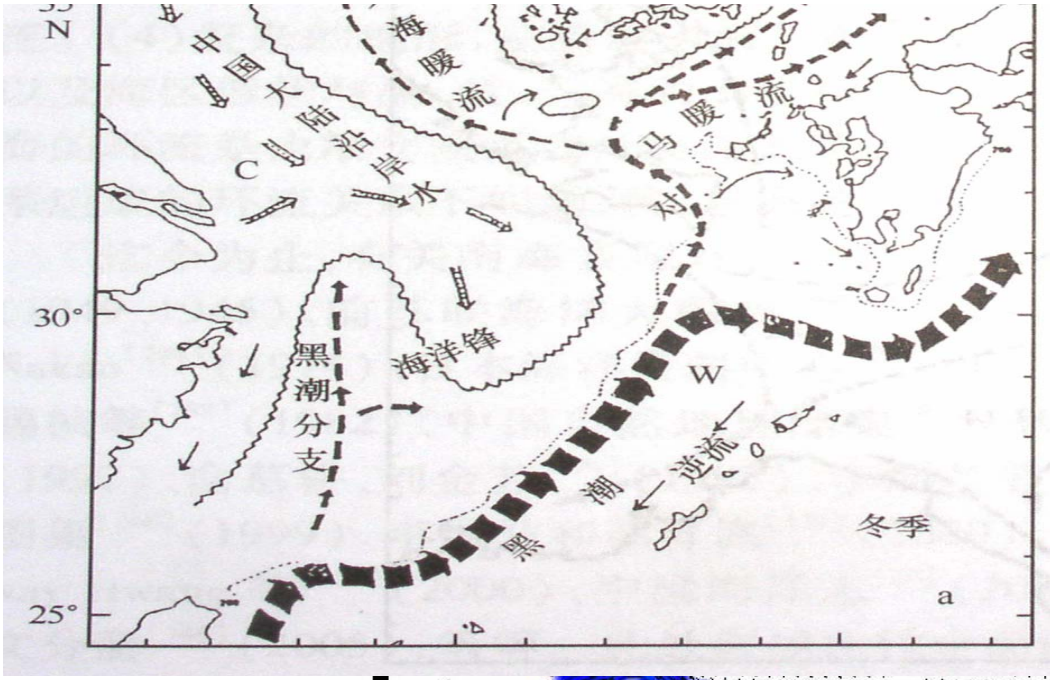
Comparisons of two lateral boundary setups



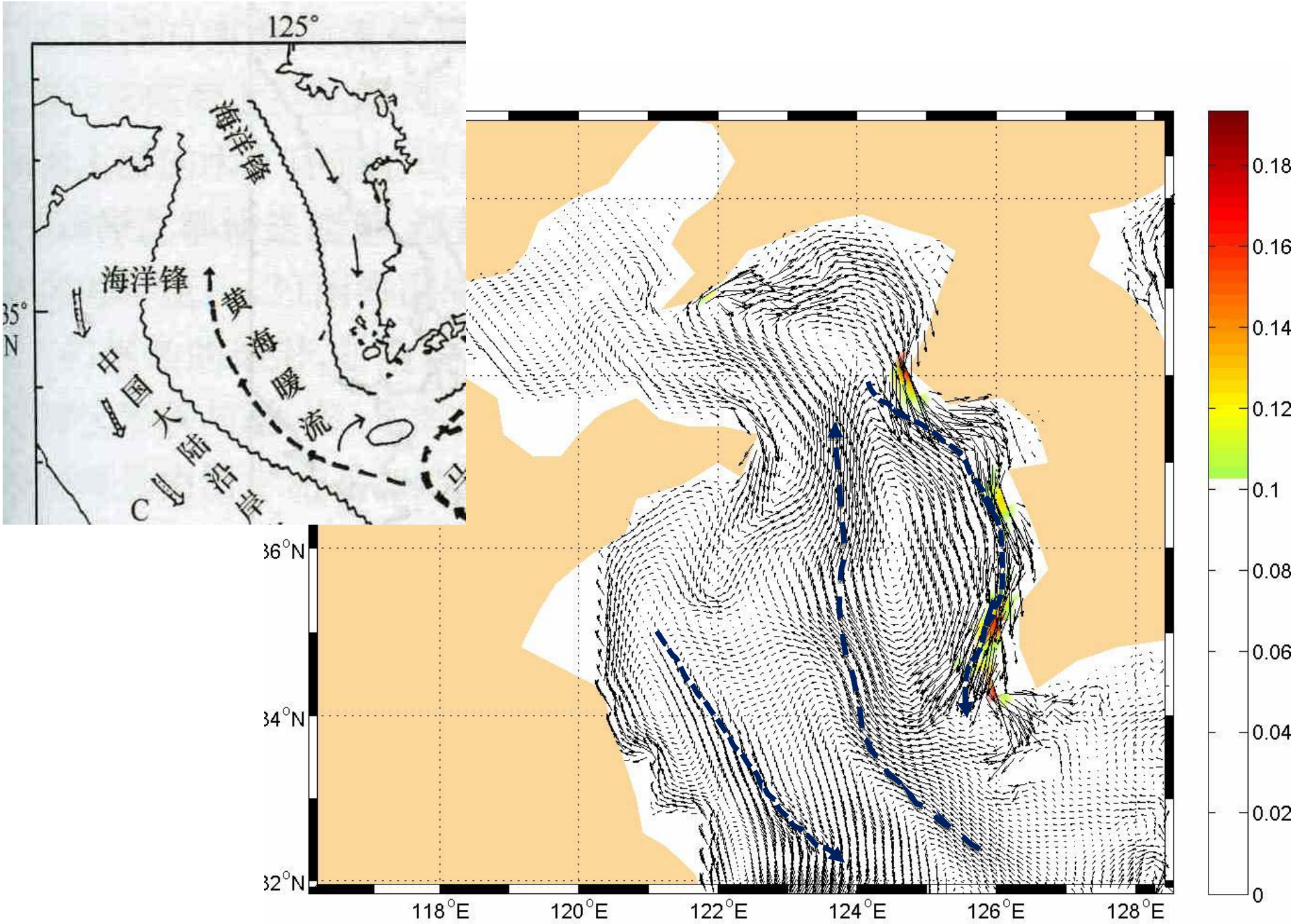
Vertical averaged current in SCS in Feb,2000



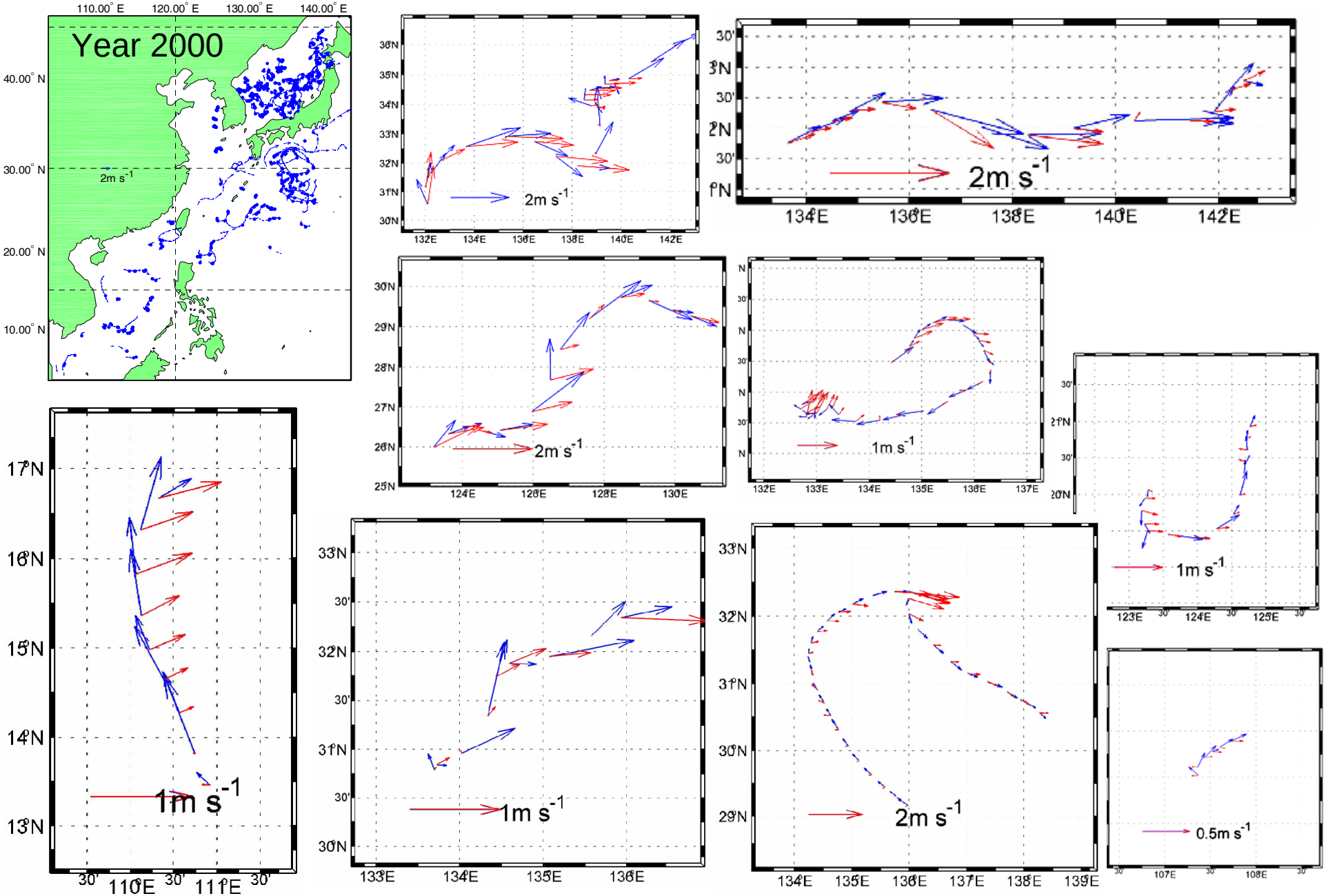
Observed transport at the Luzon strait: 2-3 Sv

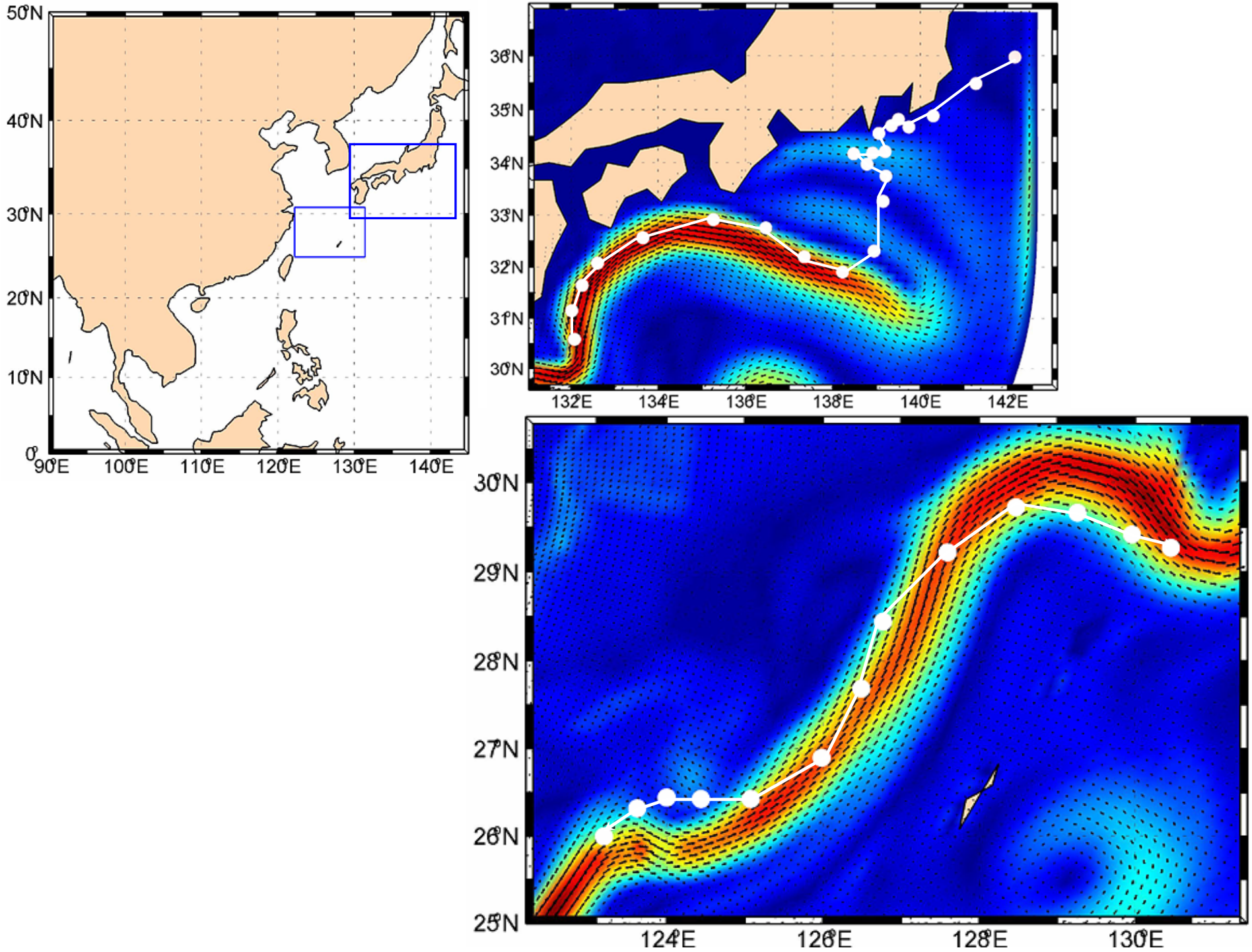

N
30°
25°
中国大陆沿岸水
C
海洋锋
黑潮分支
W
黑潮逆流
冬季
a
海暖流
马暖流
对

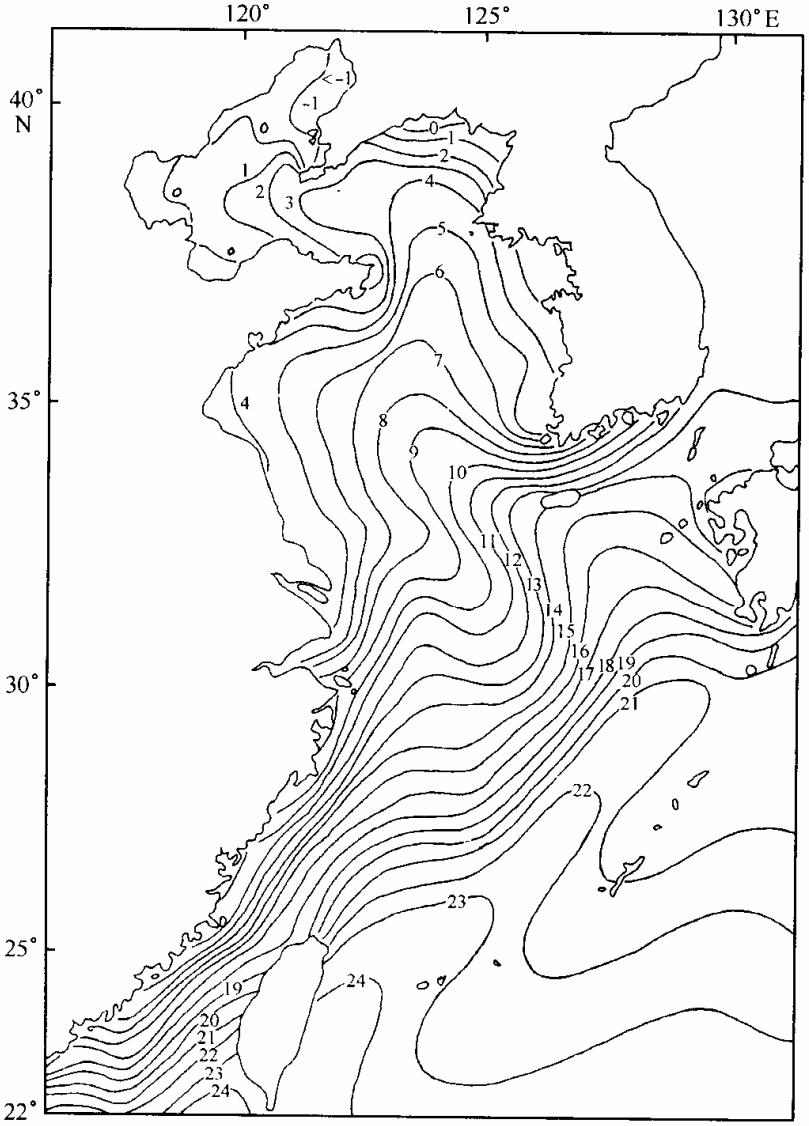
30°N
28°N
26°N
122°E
124°E
126°E
128°E
130°E
132°E
1.4
1.2
1
0.8
0.6
0.4
0.2
0


125°
海洋锋
海洋锋
黄
海
暖
流
中
国
大
陆
沿
岸
流
36°N
34°N
32°N
118°E
120°E
122°E
124°E
126°E
128°E
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0

Surface velocity: simulation vs surface drifters




50°N
40°N
30°N
20°N
10°N
0°
90°E
100°E
110°E
120°E
130°E
140°E
36°N
35°N
34°N
33°N
32°N
31°N
30°N
132°E
134°E
136°E
138°E
140°E
142°E
30°N
29°N
28°N
27°N
26°N
25°N
124°E
126°E
128°E
130°E



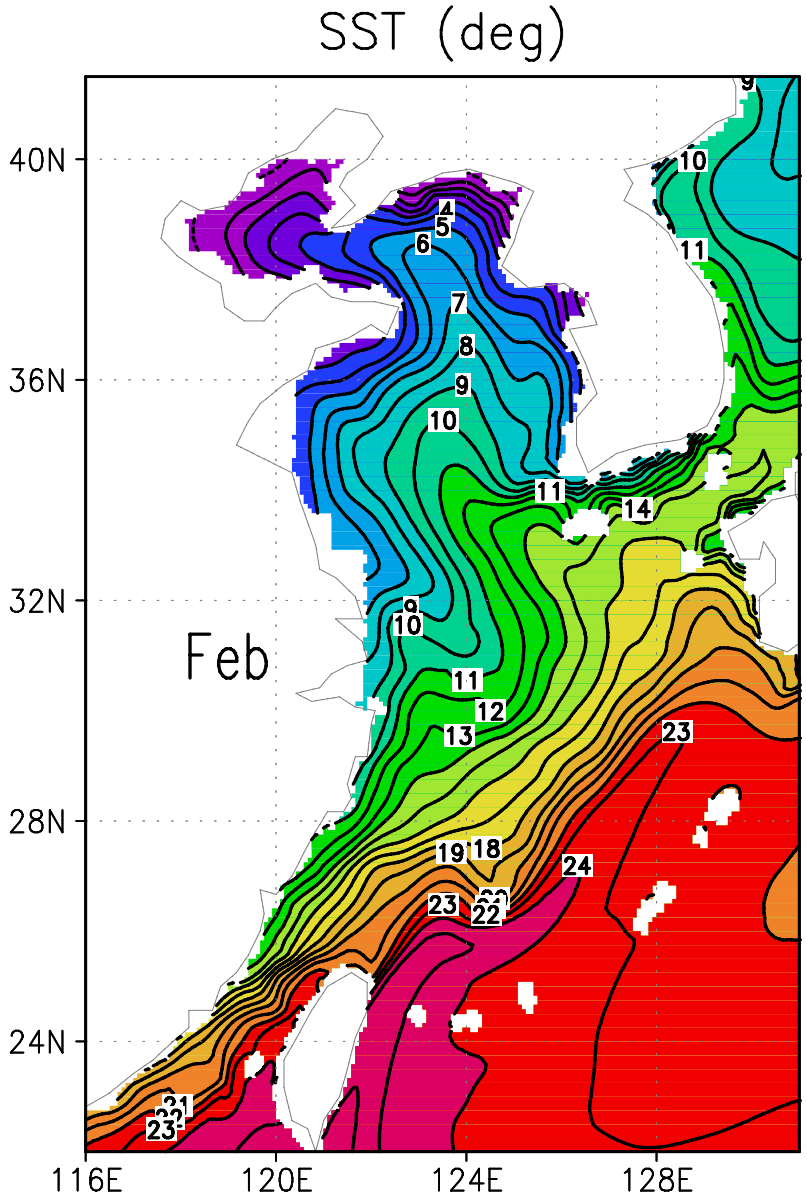
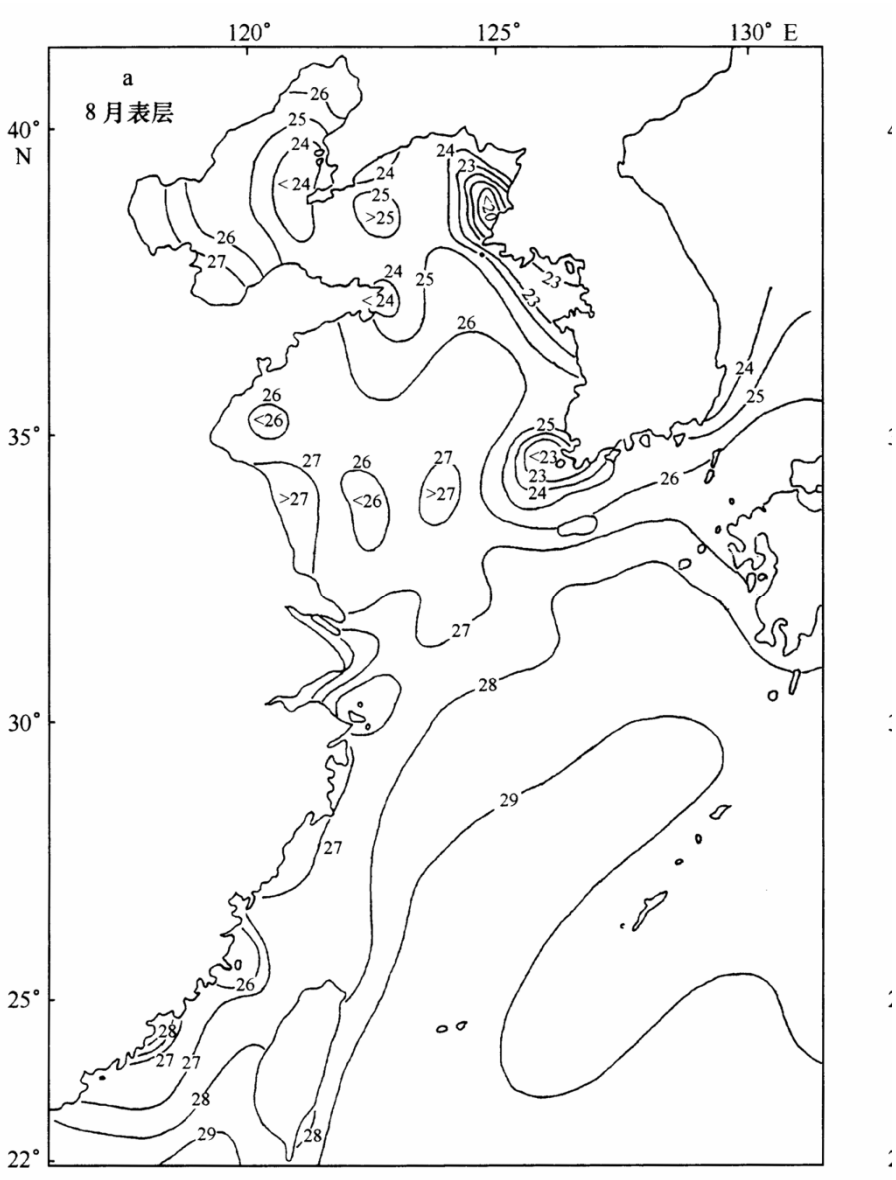
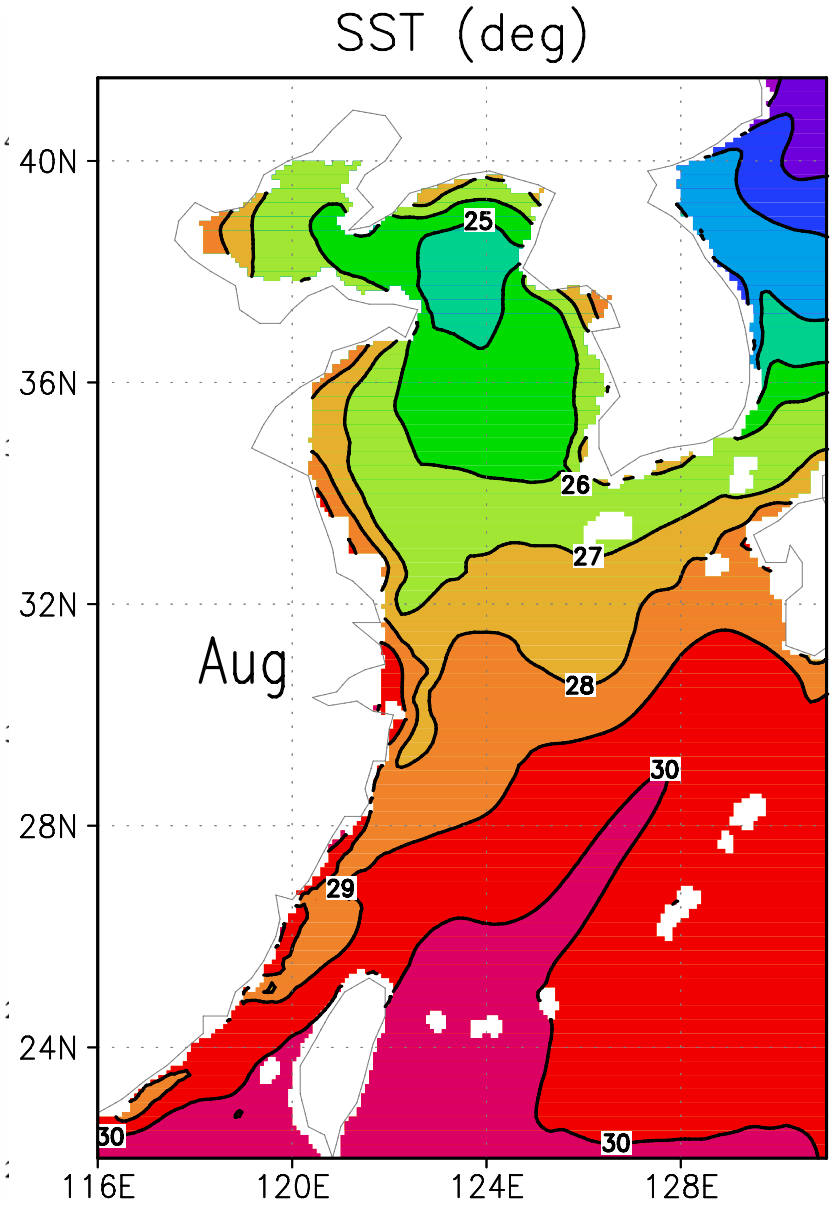


图 3.1.2　2 月渤海、黄海、东海表层水温（℃）分布（多年平均）[8]


a
8 月表层
120°
125°
130° E
40° N
35°
30°
25°
22°


SST (deg)
Aug
40N
36N
32N
28N
24N
116E
120E
124E
128E
25
26
27
28
29
30

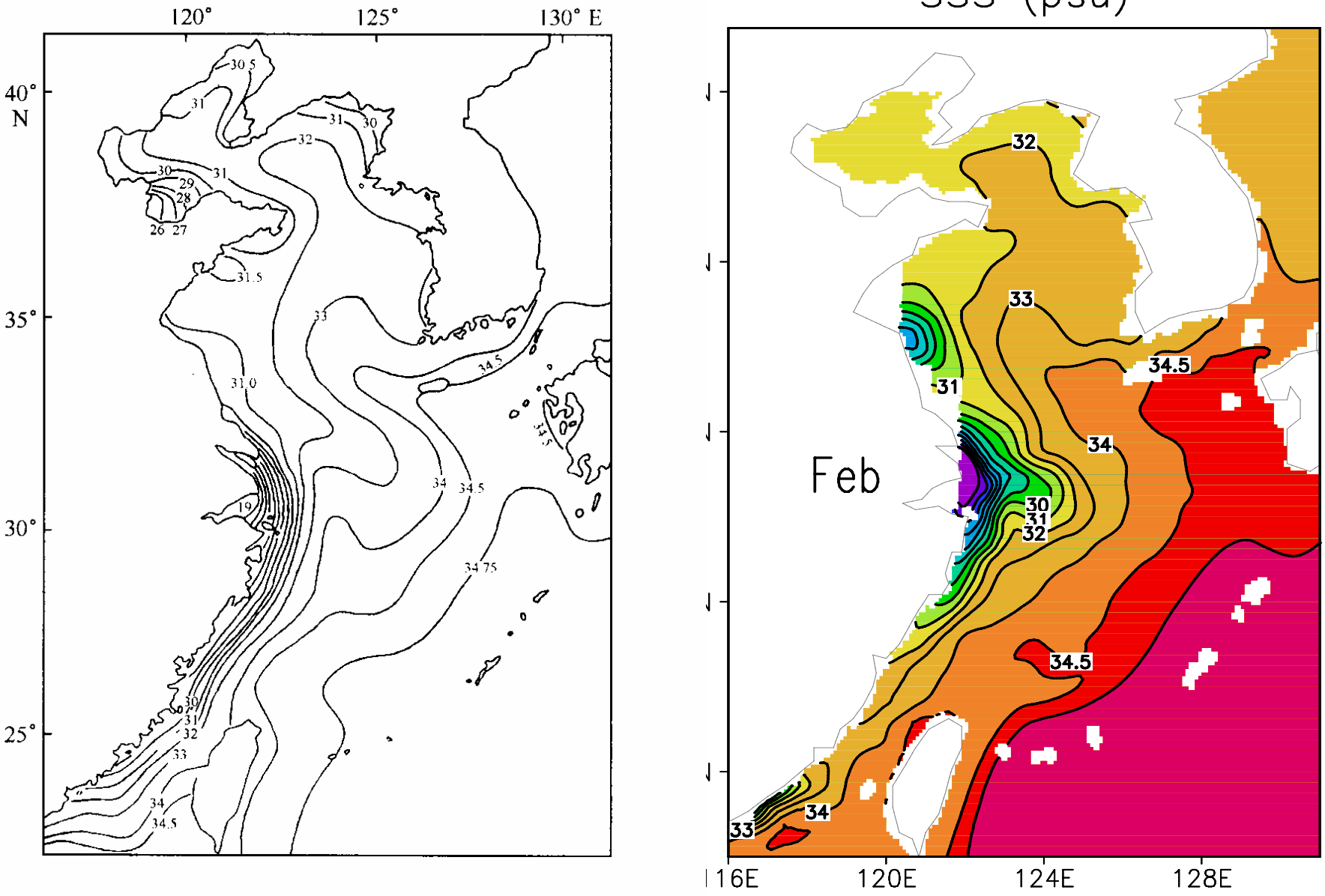
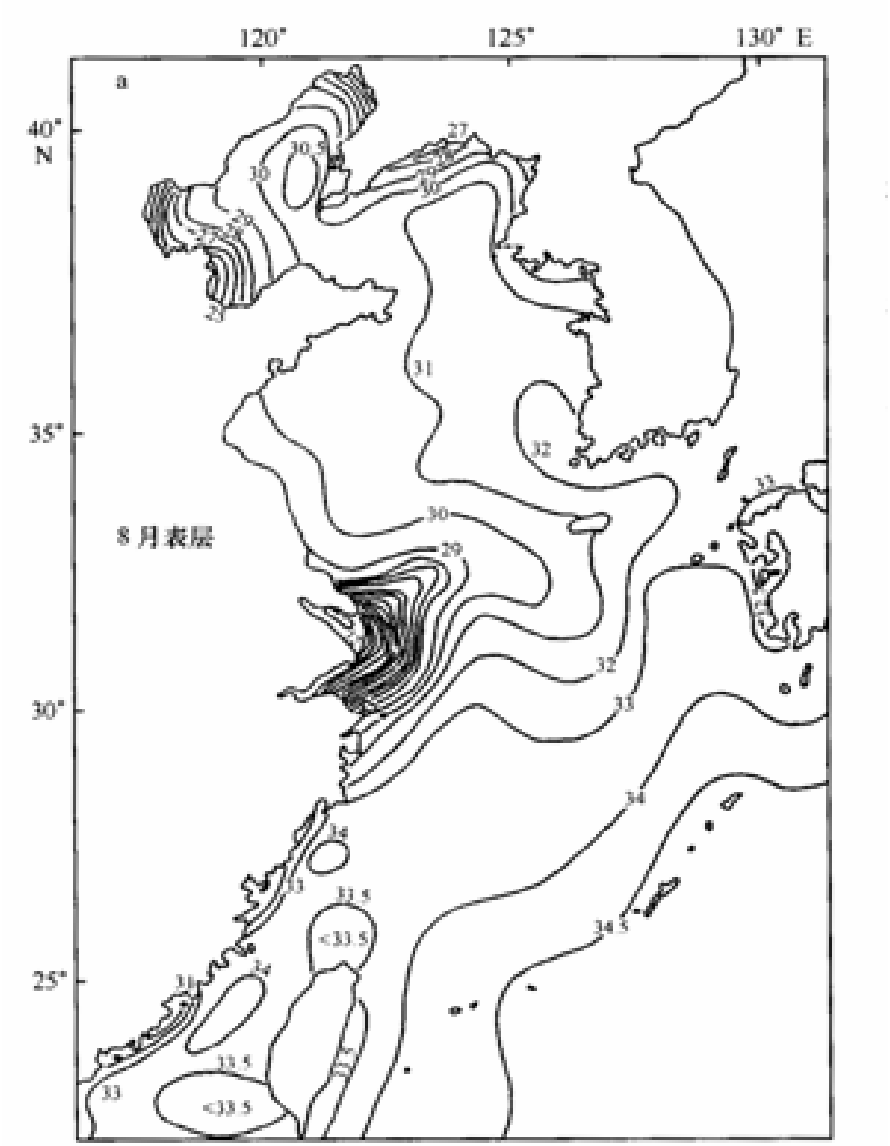
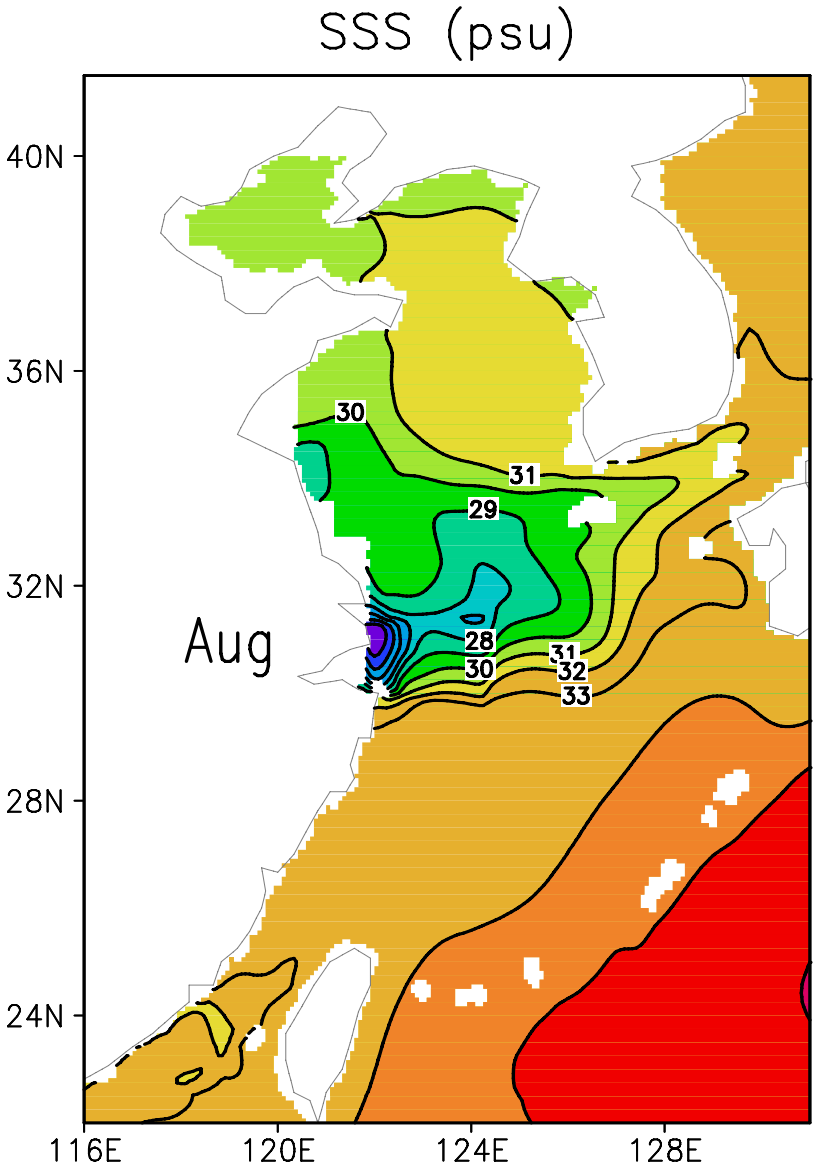
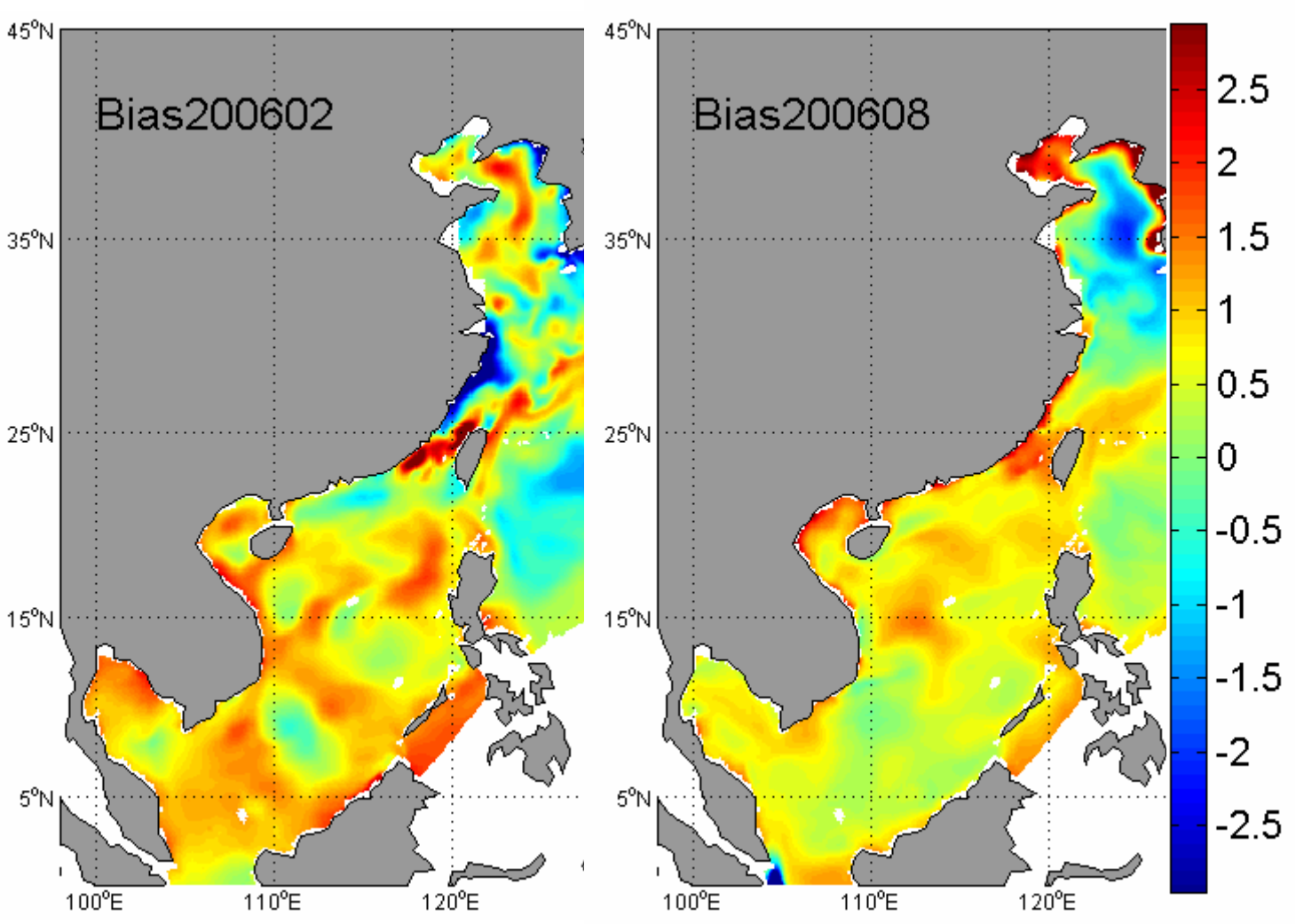


图 3.2.1　2 月渤海、黄海、东海表层盐度分布（多年平均）[8]


120°
125°
130° E
40° N
35°
30°
25°
a
8月表层
27
30
31
32
33
34
34.5
<33.5
<33.5


SSS (psu)
40N
36N
32N
28N
24N
116E
120E
124E
128E
Aug
30
31
29
28
31
30
32
33

Model SST bias (comparing to FSTIA GHRSST product)



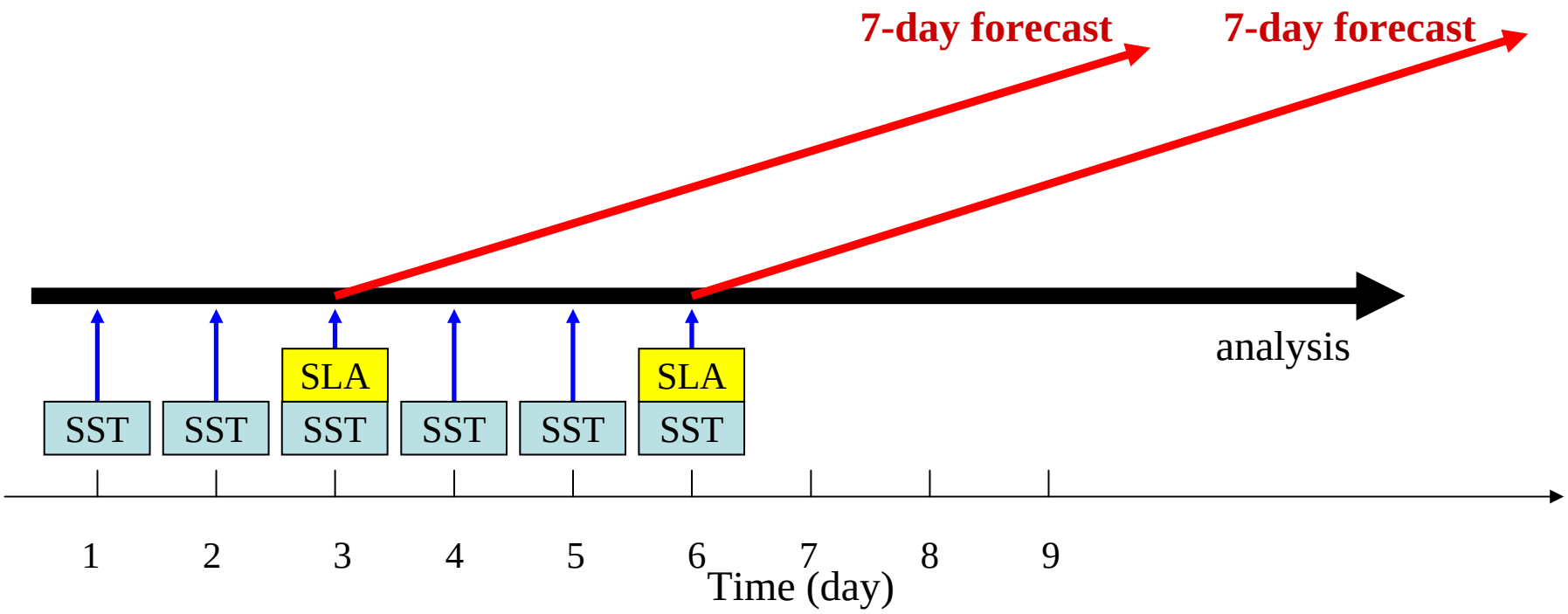
Data Assimilation System

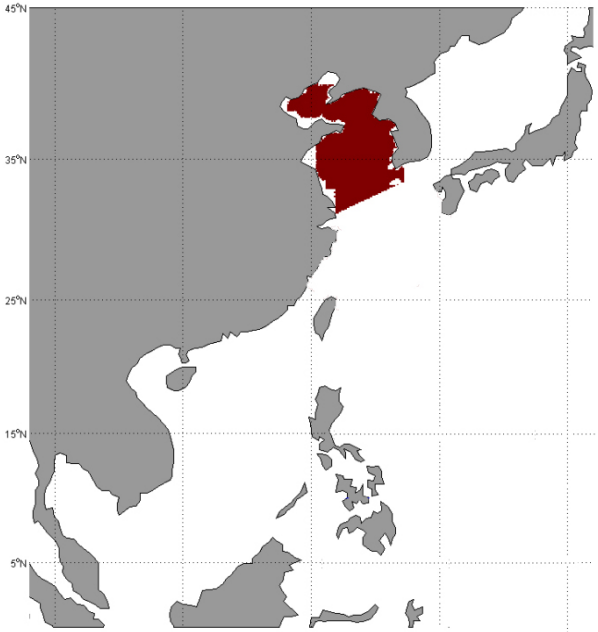
Ensemble optimal interpolation (EnOI) scheme

- Originally from TOPAZ system;
- A new Argo profile assimilation scheme based on Thacker and Esenkov (2002) ;
- Recoding the algorithm allowing to decompose model domain and process observations in patch.

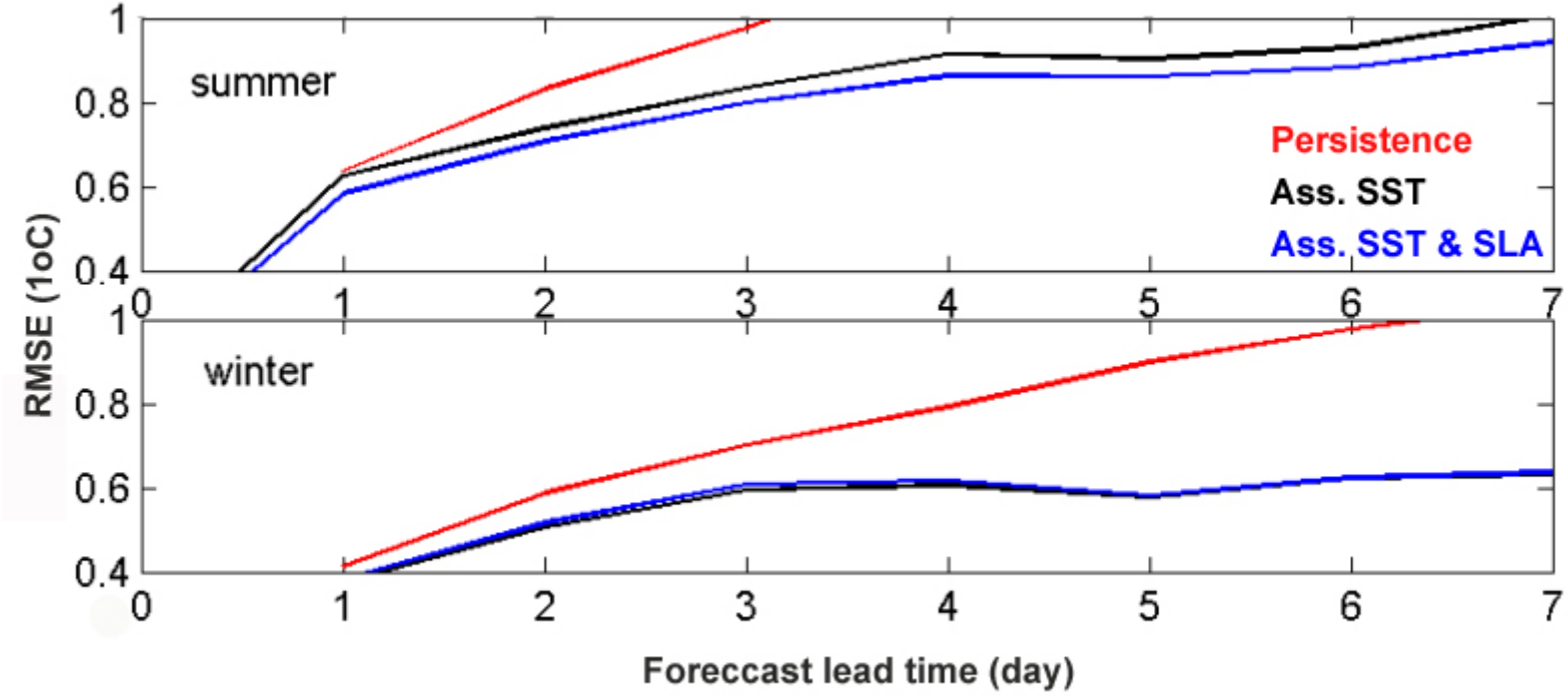
Hindcast experiments

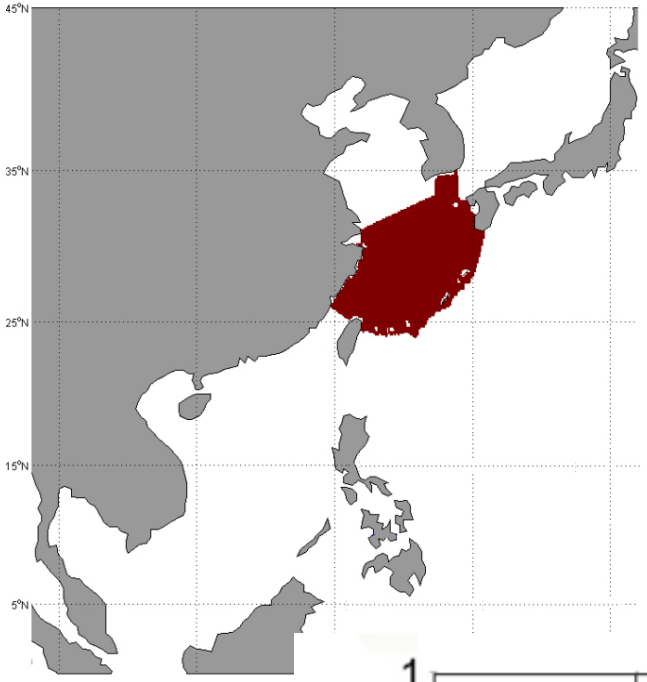
- FSTIA daily SST product is assimilated every day at 00:00 time;
- Along track Jason SLA data is assimilated every 3 days at 00:00 time;
- Hindcast experiments: assimilating SST only and assimilating SST&SLA;
- Location length scale 250km;
- Experiment time window: one year (2006).
- Forecasts are verified against FSTIA SST (Winter & Summer so far).



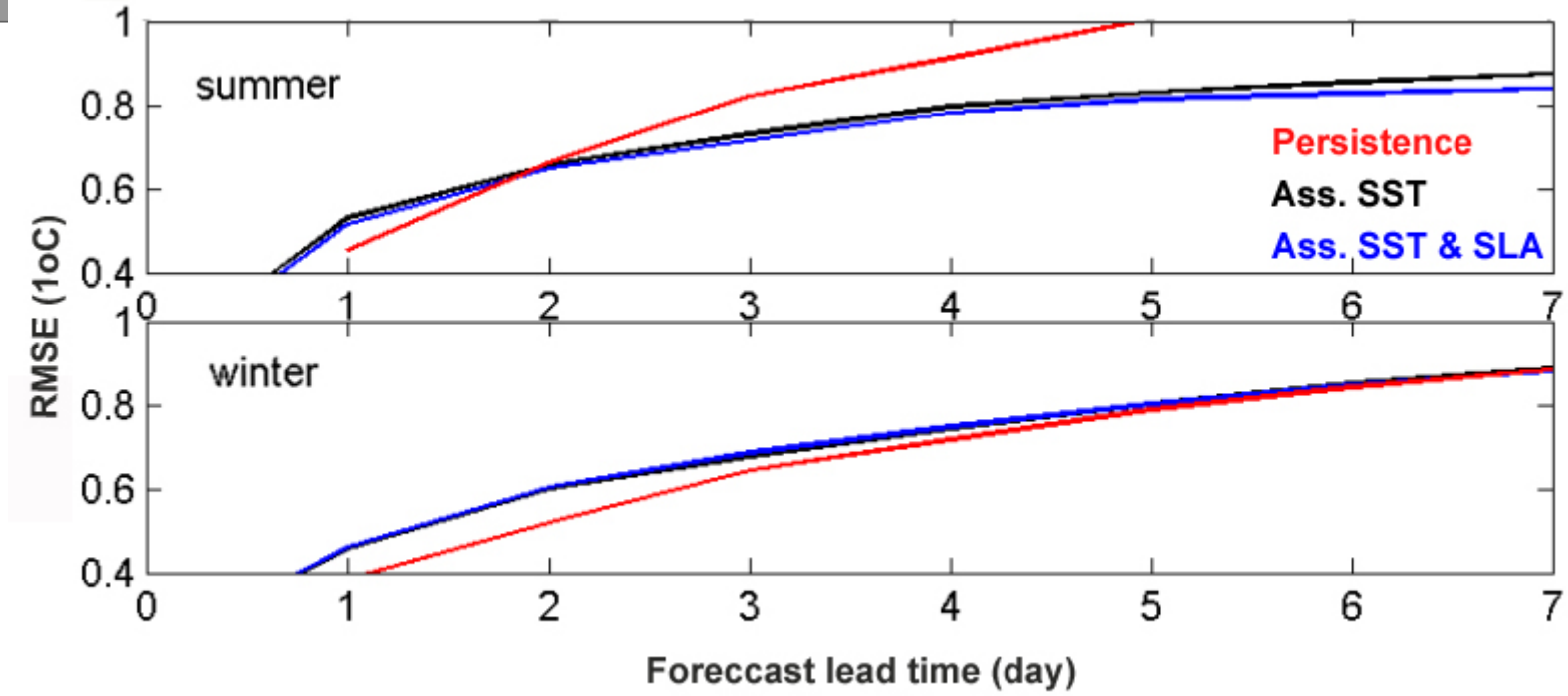


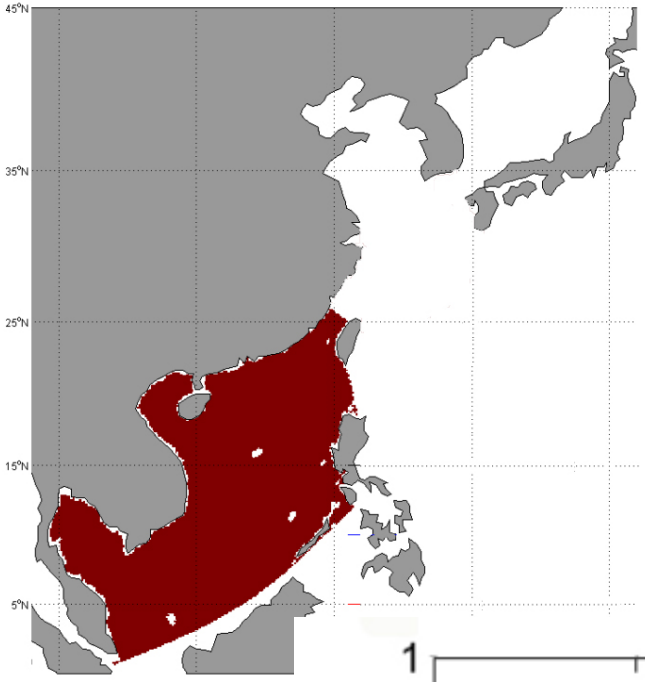
Bohai Sea/Yellow Sea



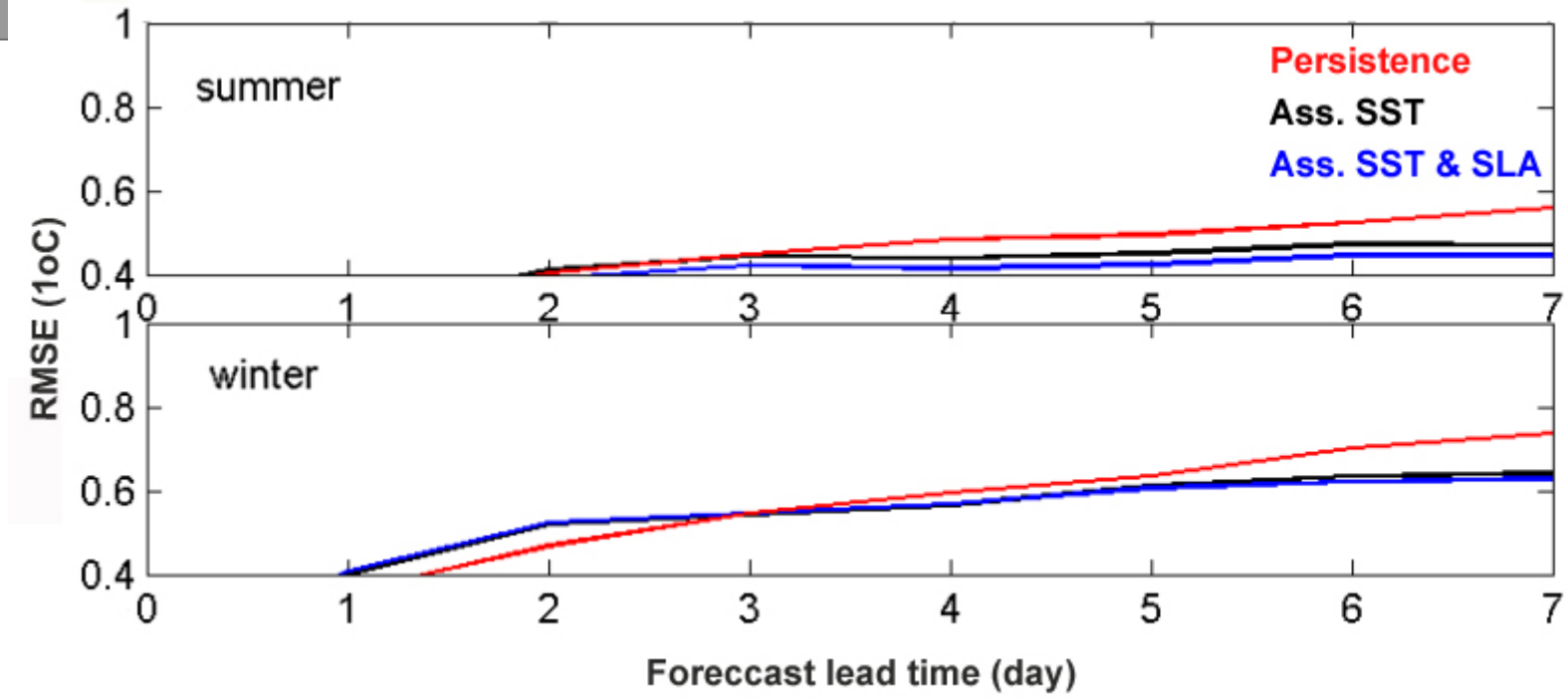


East China Sea

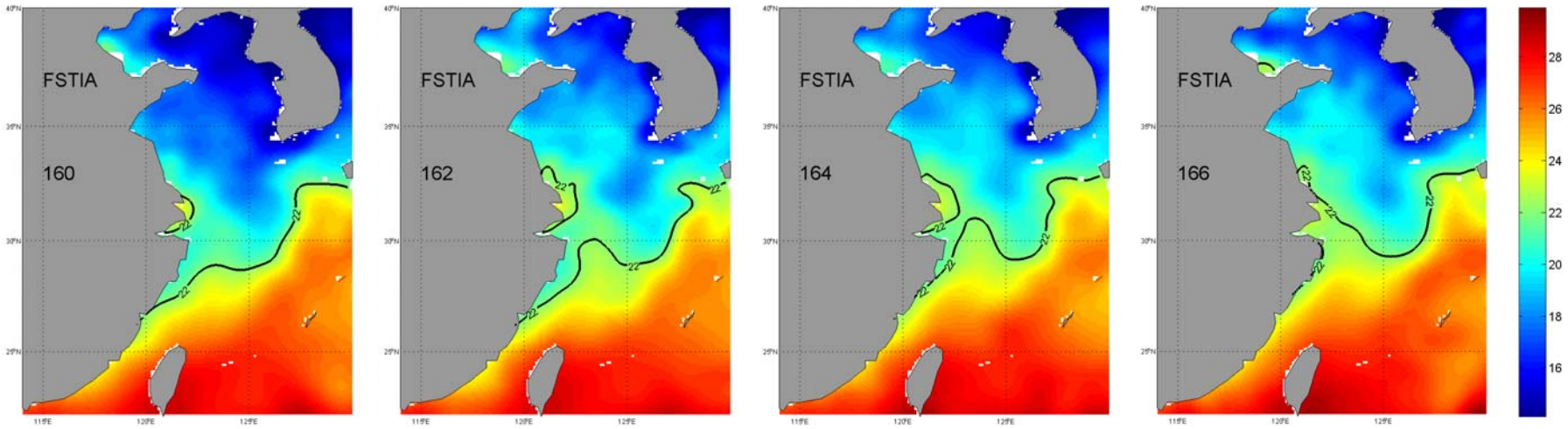




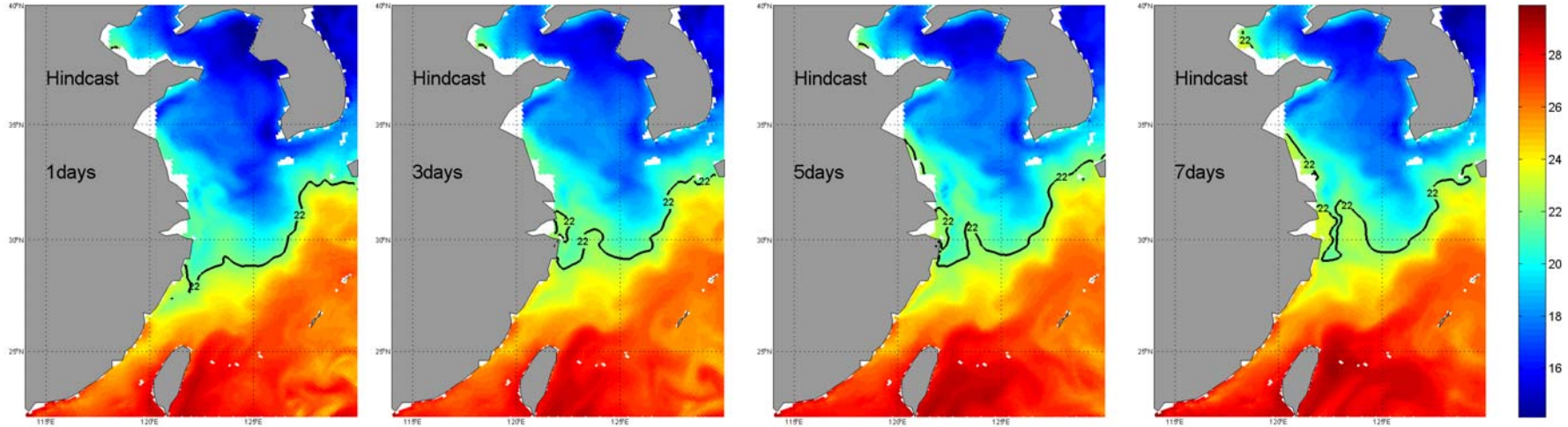
South China Sea



Observation

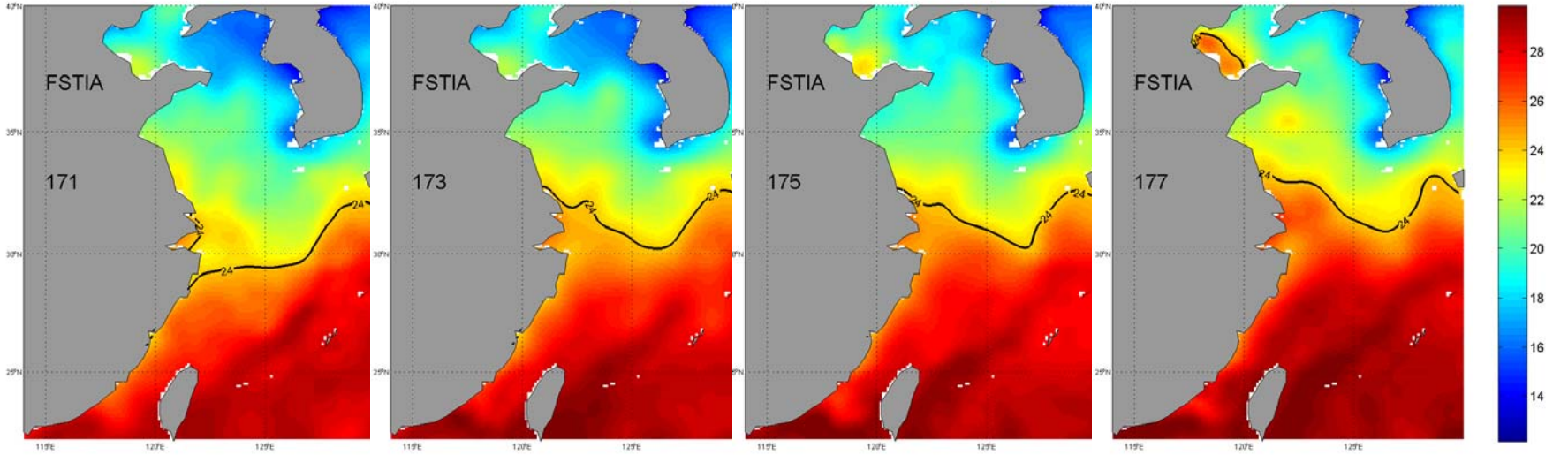


Forecast

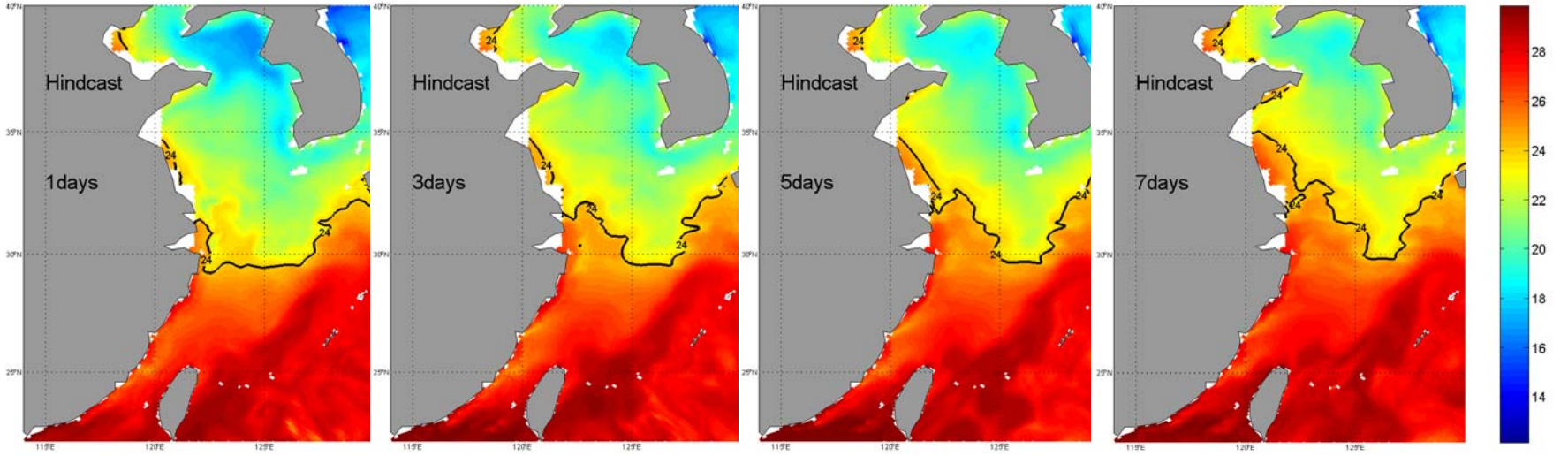


June 10 June 12 June 14 June 16 2006

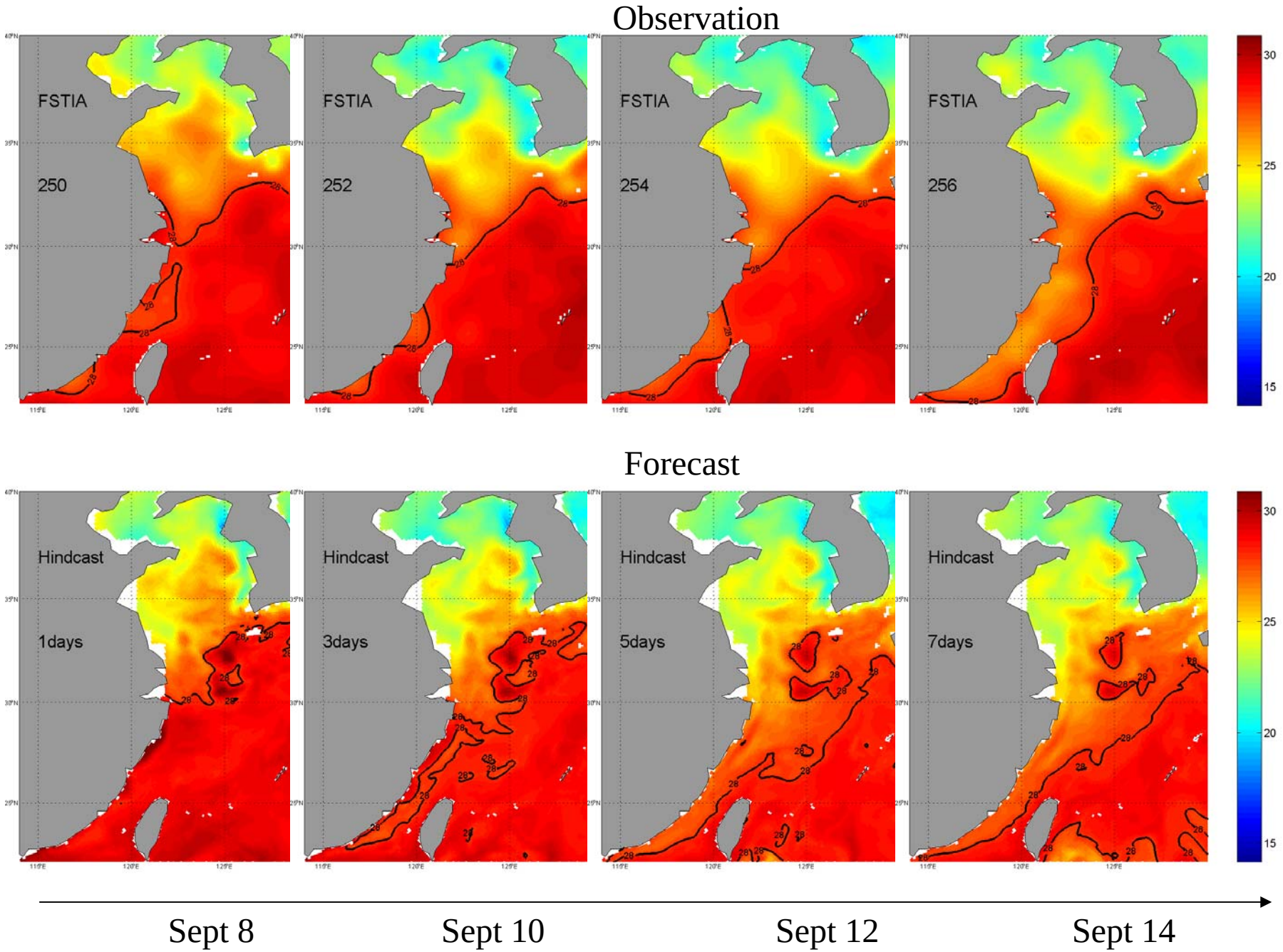
Observation



Forecast

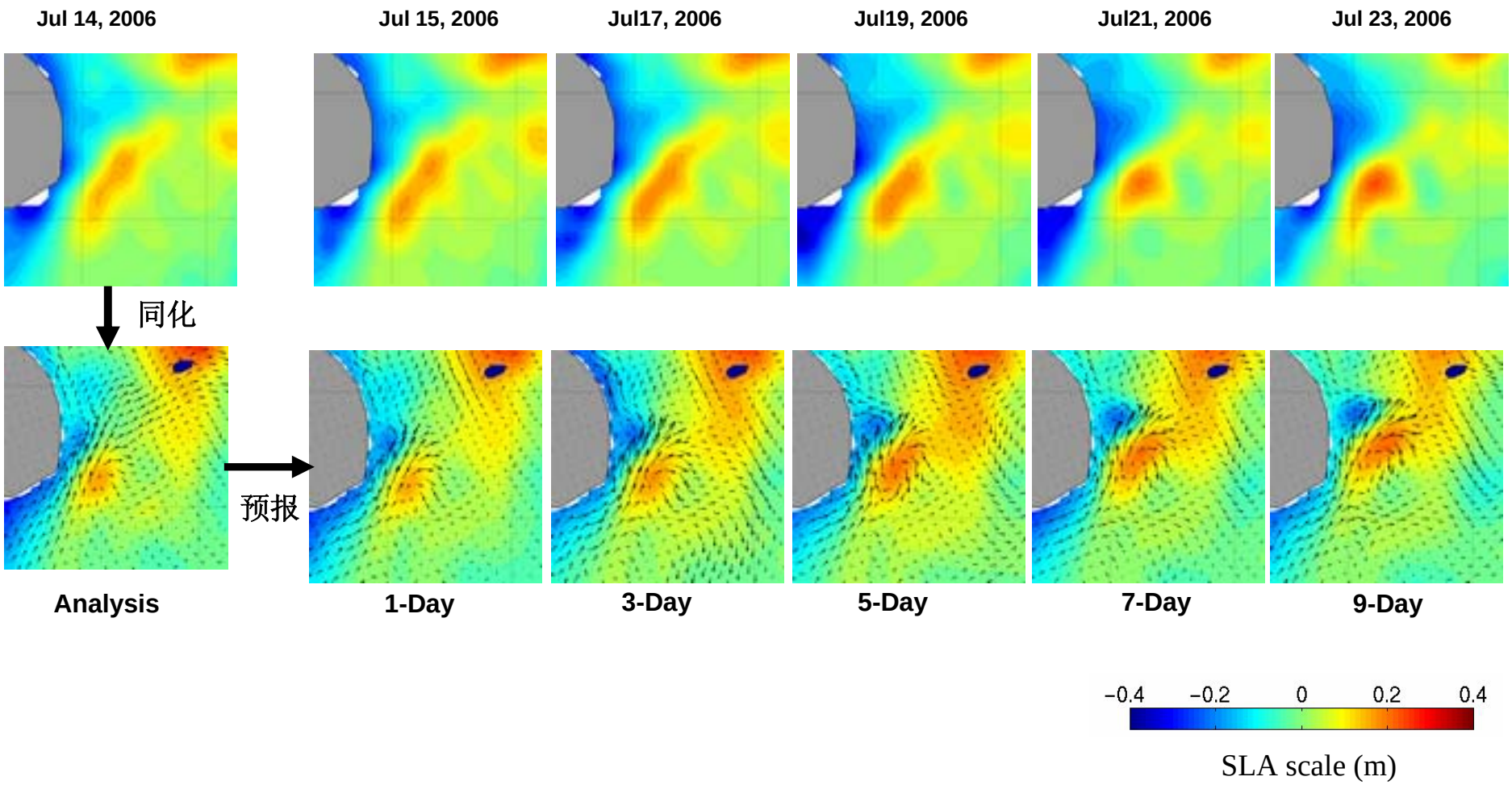


June 21 June 23 June 25 June 27 2006


Observation
FSTIA
250
FSTIA
252
FSTIA
254
FSTIA
256
30
25
20
15
Forecast
Hindcast
1days
Hindcast
3days
Hindcast
5days
Hindcast
7days
30
25
20
15
Sept 8
Sept 10
Sept 12
Sept 14

上: 观测的SLA

下: 同化和预报的SLA和表层流



上: 观测的SLA

下: 同化和预报的SLA和表层流