A system development for near-realtime data exchange between ship and shore-based analysts in FRA

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background

1)R/V Intranet and WWW

In this decade, more than half of research vessels (R/Vs) have equipped intranet within the R/Vs in FRA.

The internet system have overwhelmed around the world.

2)land-ship communication

However, the connection between R/Vs and shore-based analysts have been limited because of low speed and high cost lines between them.

N-STAR: land→64kbps→ship, ship→4.8kbps→land

ImmarsatB+HSD: land→64kbps→ship, ship→64kbps→land

background

3)i-space project **(JAXA: Japan Aerospace and Exploration Agency)**

satellite broadband communication

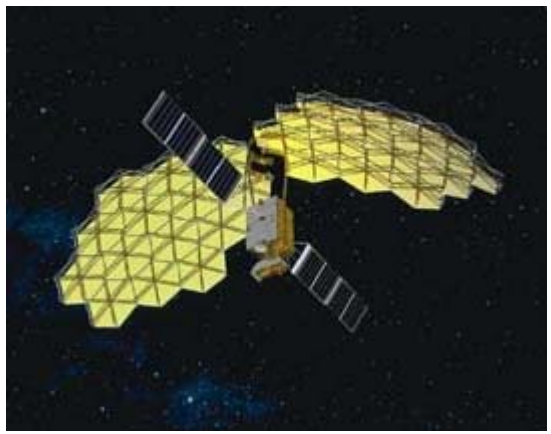
2004→2006 ETS-VIII: 1.5Mbps

2006→2007 WINDS: 155Mbps

in the near future, realtime data sharing between land and shore-based analysts will be enabled.

efficiency of the cooperative observation will be much improved.

Develop a near-realtime data sharing on the narrowband communication as the preparation for the near future broadband satellite communication.



ETS-VIII

WINDS

Current situation of land-ship data trasfer

1. land to ship (one-way transfer)

2. only simplified information by BATHY/TESAC messages

Delivered to the world wide meteorological office through GTS

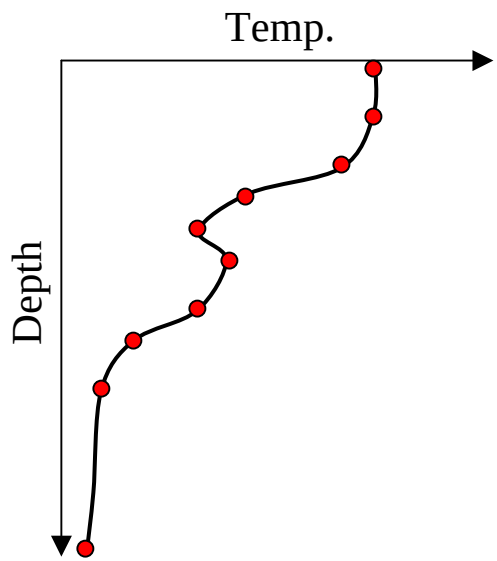
However, the transfer ratio of BATHY/TESAC messages are not high in the fisheries community,

because the meanings is insufficiently understood,

shortage of the knowledge about transfer form

the communication apparatus is not equipped

the profits reduction to data provider is not apparent



objective

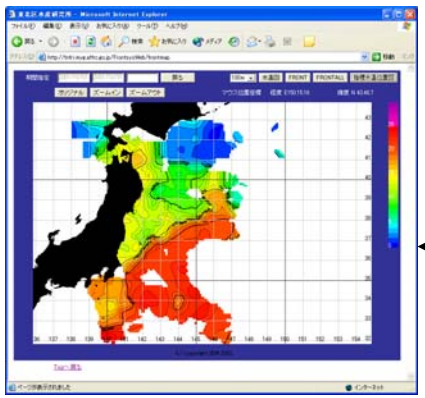
1. enable two-way data transfer

2. gather the rate of BATHY/TESAC transfer

realtime ocean information delivery system

realtime and interactive communication with ocean database through WWW

user



delivery to the world wide meteorological office thorough GTS

TESAC message

2. realtime transfer of hydrographic data and TESAC message

4. realtime transfer of data from other organization

HSD

Server

Tsukuba Computer Center

3. merge the hydrographic data from ship with that from other organization

data transfer

other organizations

1. register the hydrographic data to database

5. Viewing temp. map, front map, etc. on the R/V

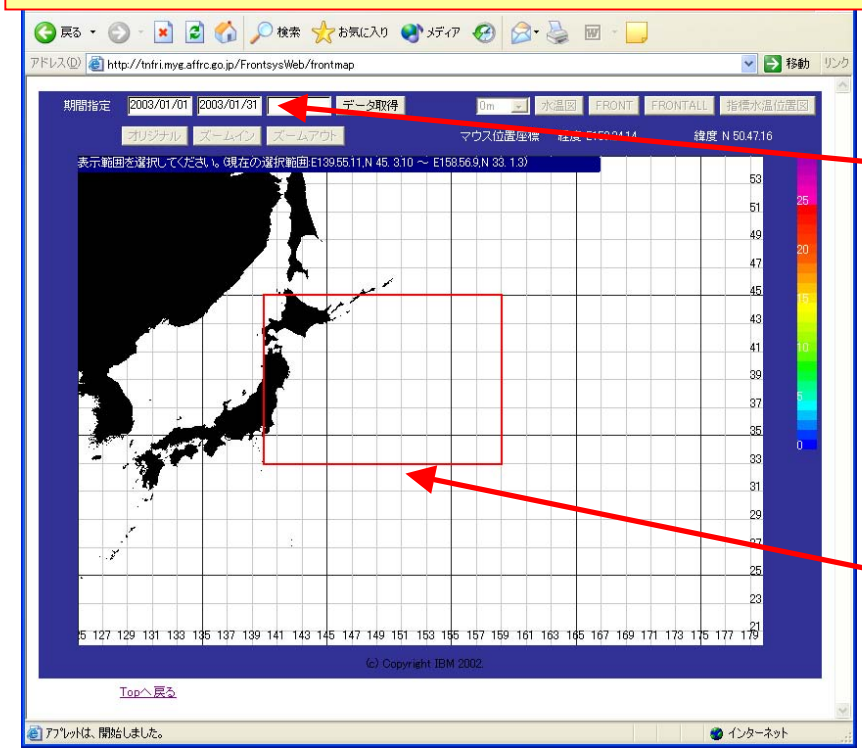
realtime ocean information delivery system

Database: IBM DB2

Web server: land: IBM WebSphere, ship: Tomcat

synchronism: exchange only updated portion in DB2 through http protocol

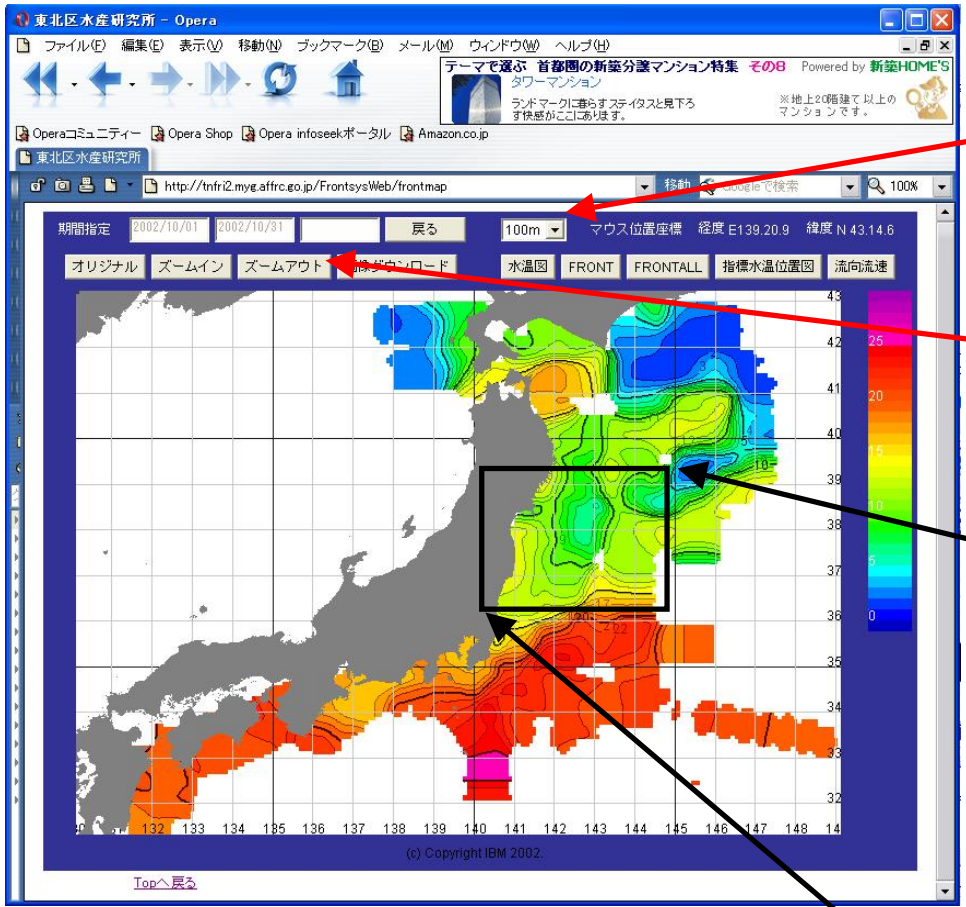
Server: land: Tsukuba computer center (Linux)
ship: Note PC (Windows)



An analysis period can be specified arbitrarily and the center of date, which coefficient of weighted average has maximum, can also be specified by user.

An analysis domain can be specified arbitrarily by user.

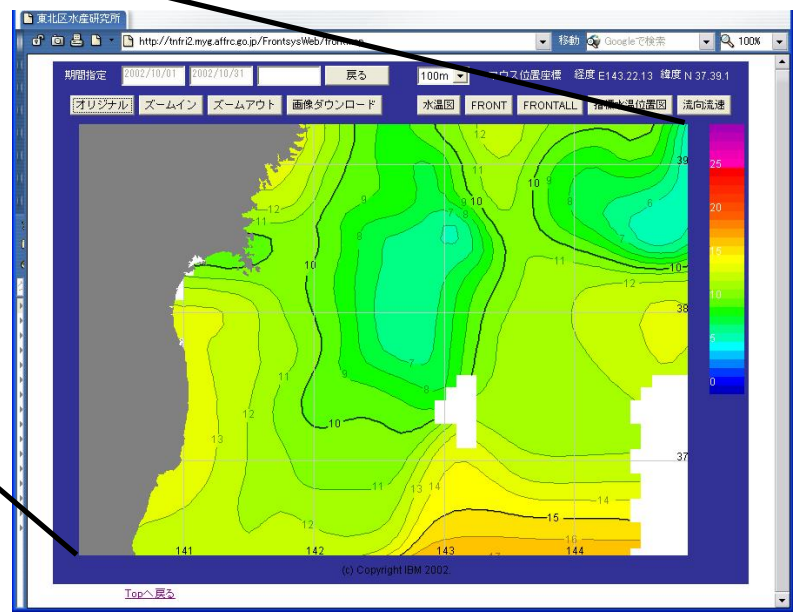
display of temperature map



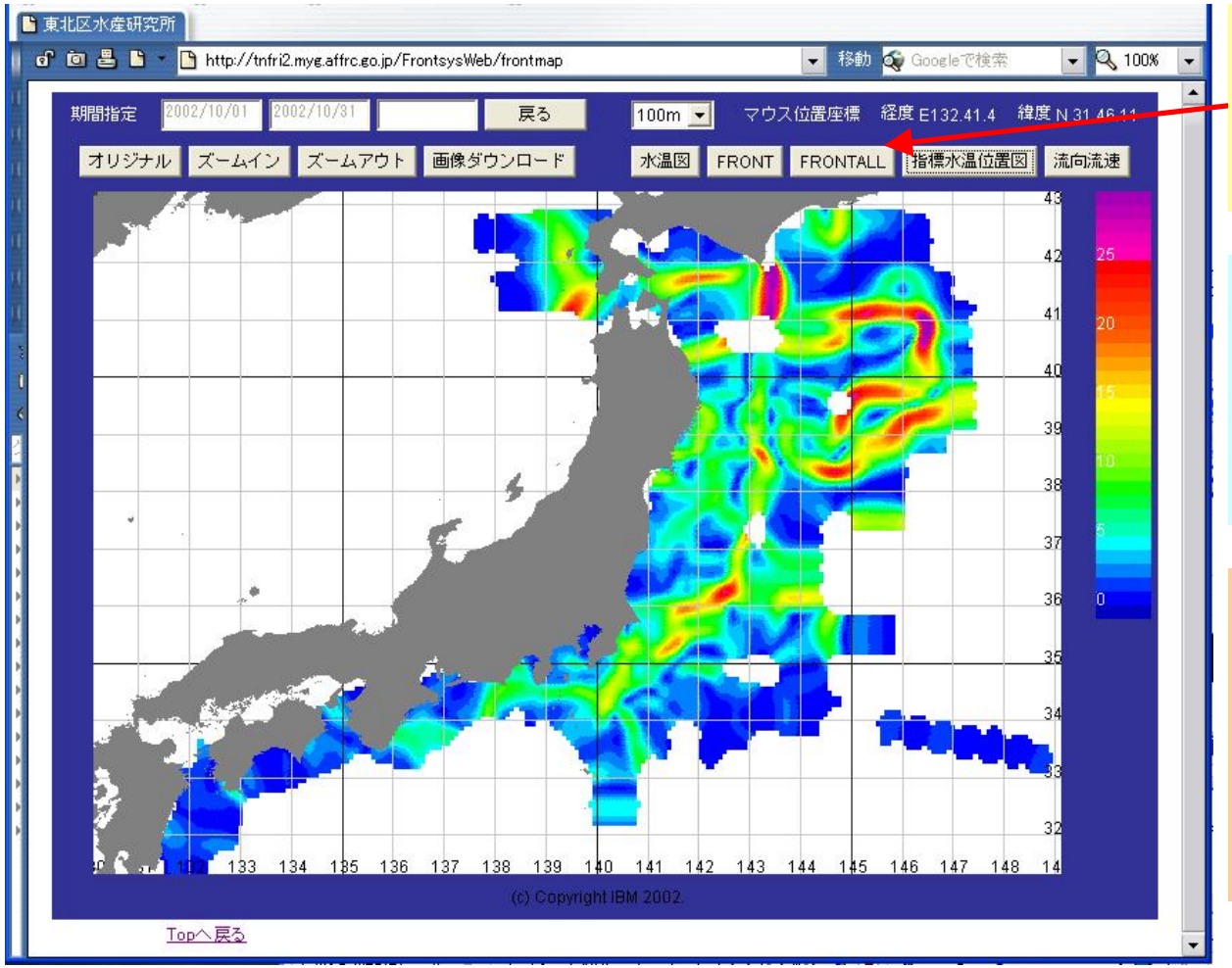
User is able to select the layer depth from 0, 50, 100, 200, 300, 400, 500m arbitrarily.

50% Zoom in and 200% zoom out are able.

Arbitrarily zoom in is also possible.



display of horizontal gradient of temperature

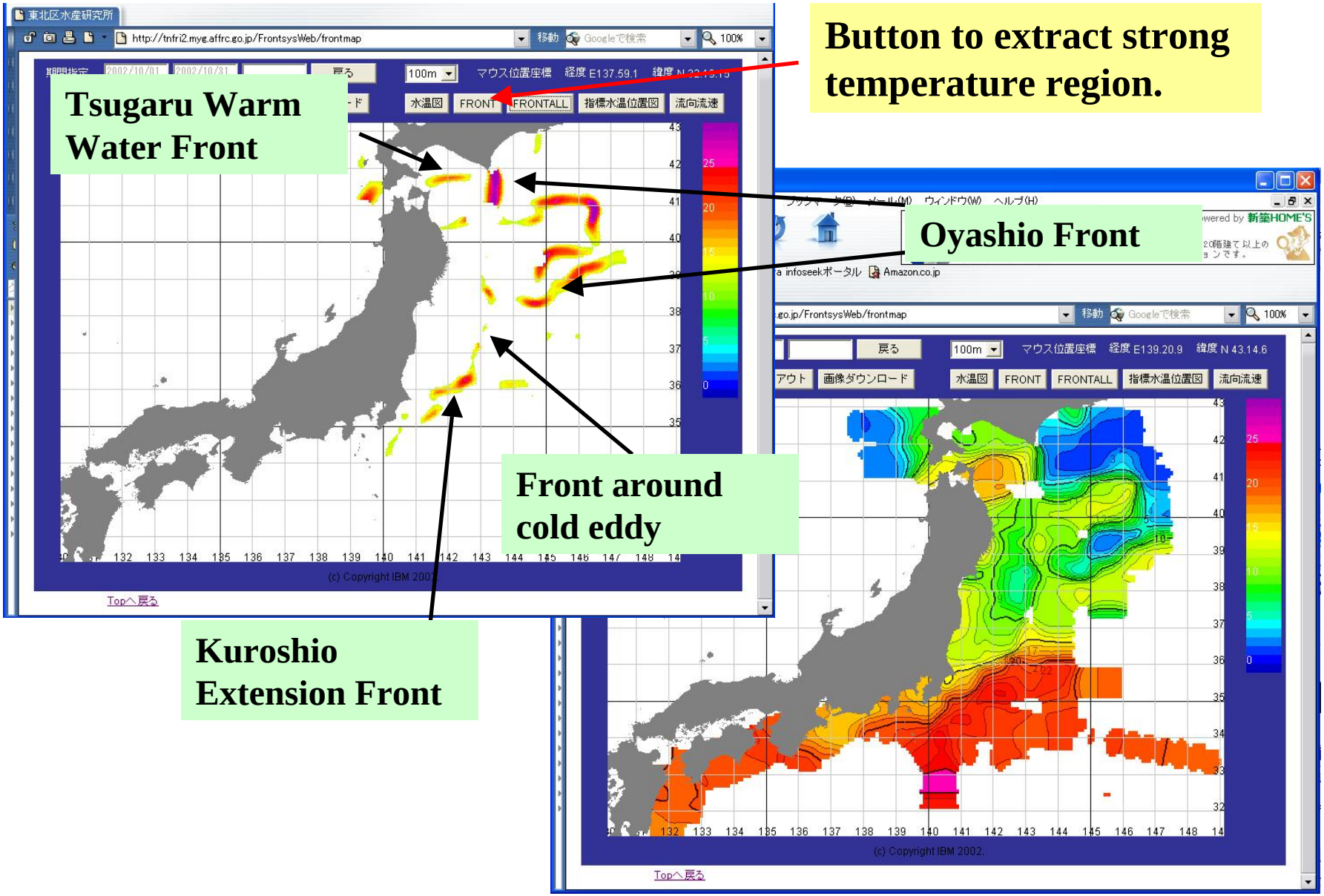


The button to display horizontal gradient of temperature.

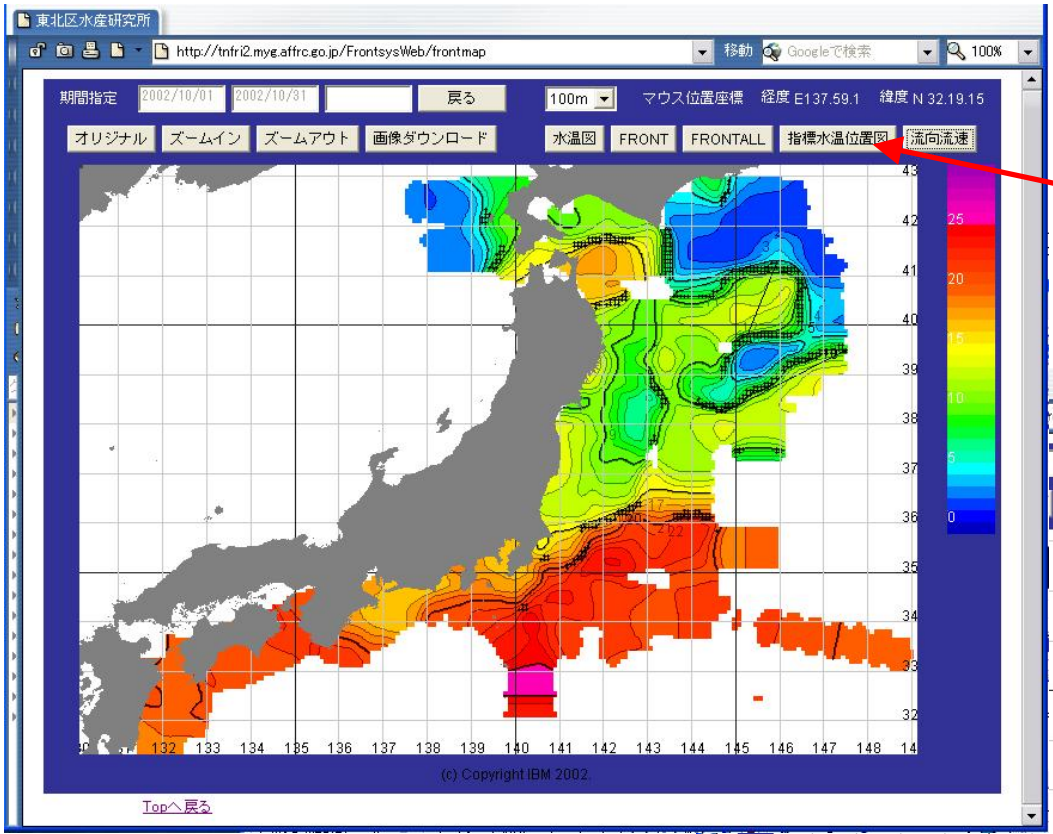
Temperature front is important factor to determine the water mass distribution.

Around temperature front, high production, dense fishery grounds, strong currents are formed.

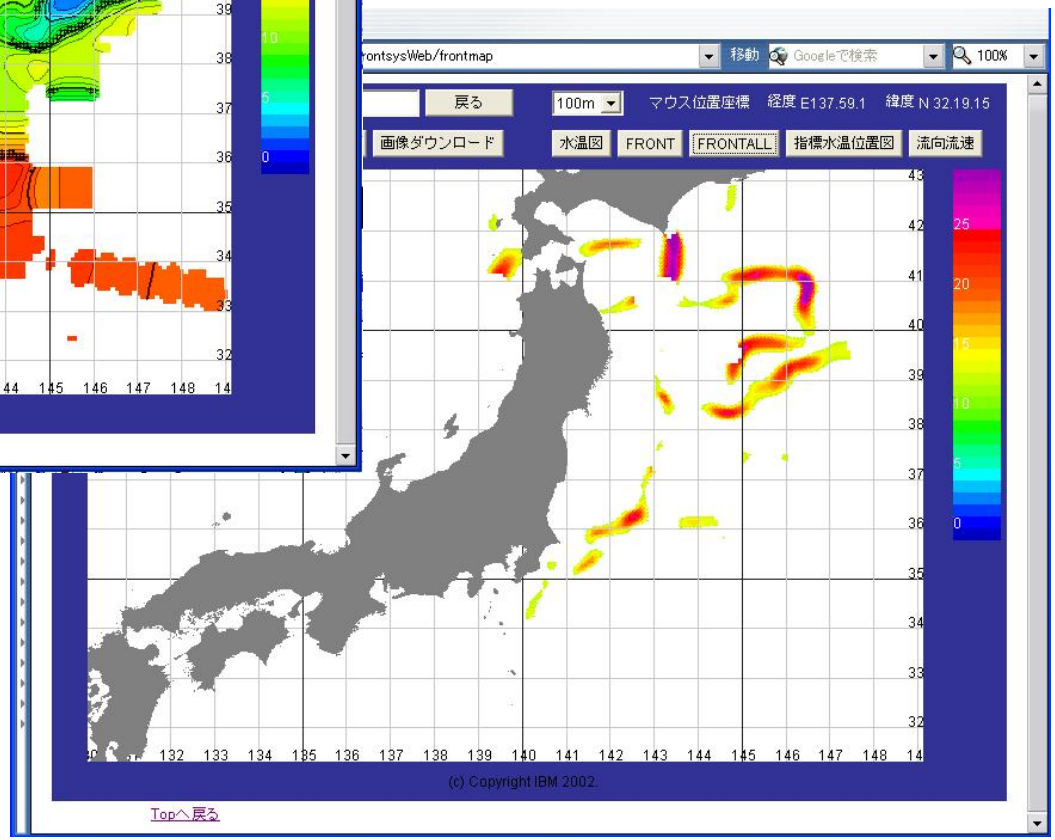
extract strong temperature front region



display of temperature indices of fronts

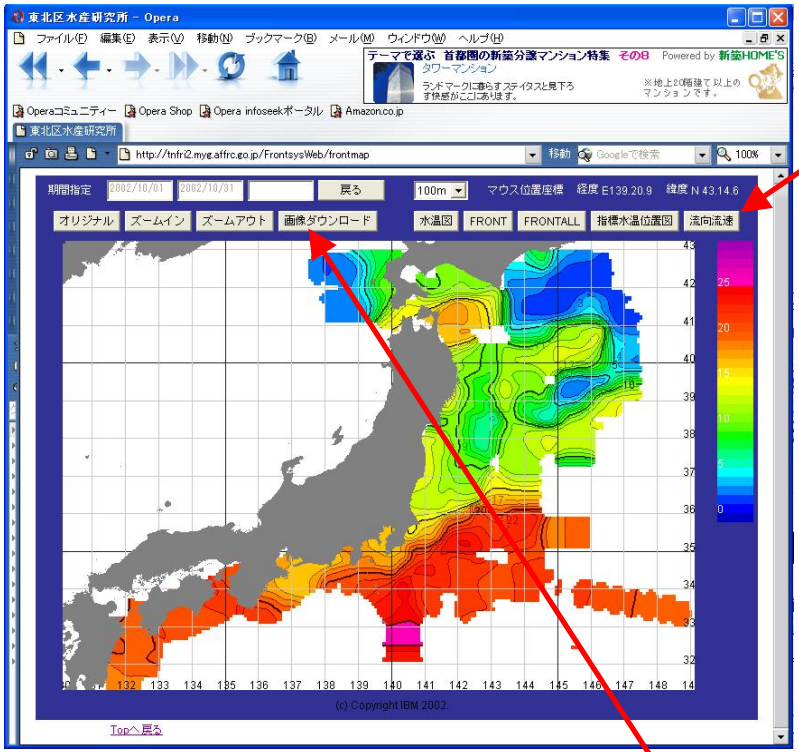


Button to display isotherms which corresponds to temperature indices of the fronts.

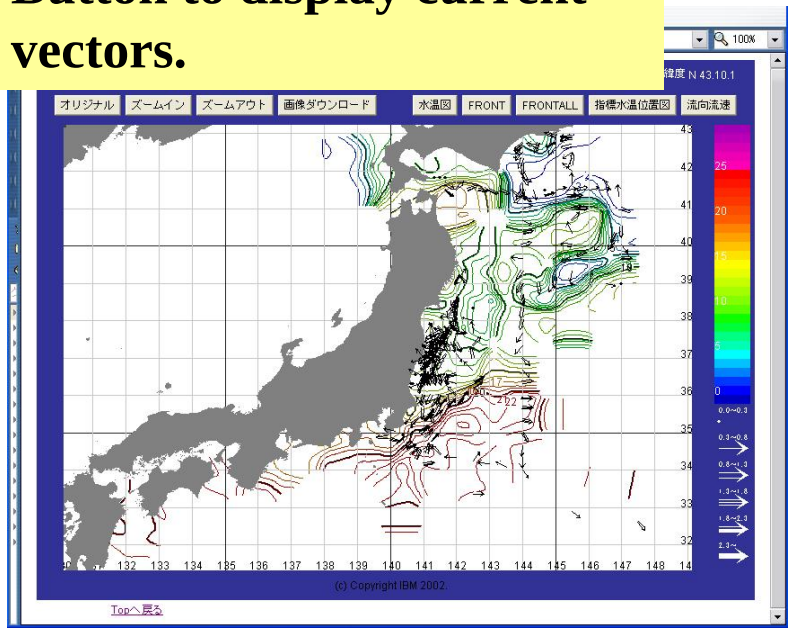


Temperature indices of the front is defined by the average temperature of the lattice of 20% higher ranks in each group.

display of current vectors and extract to jpeg file



Button to display current vectors.



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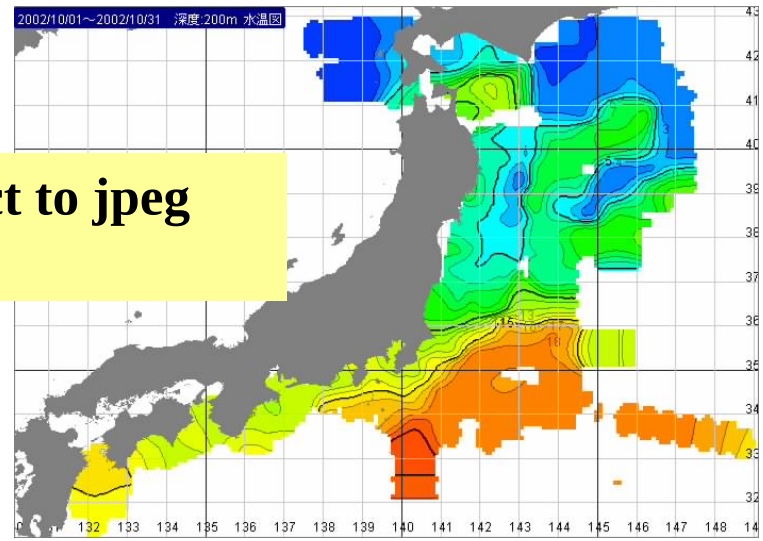
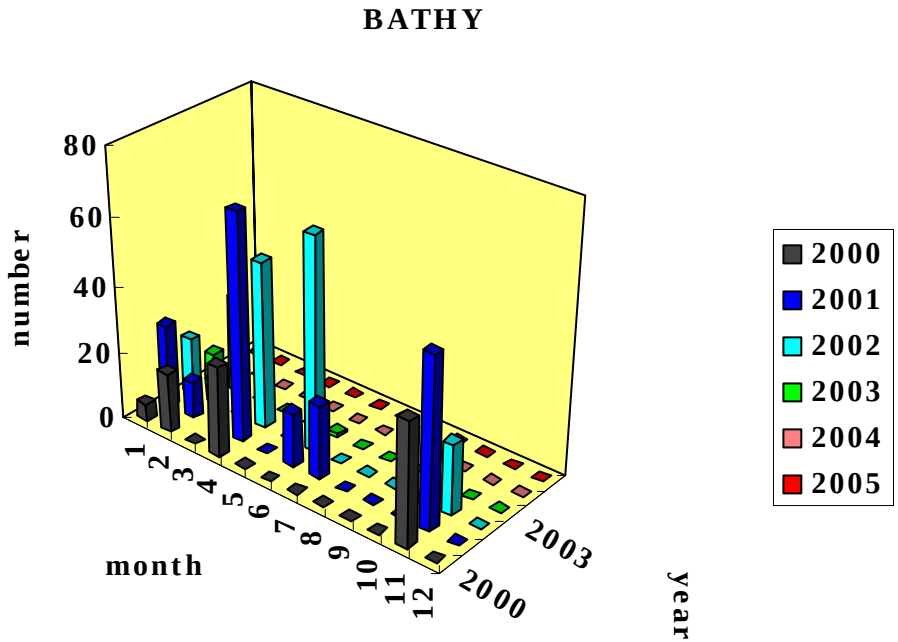
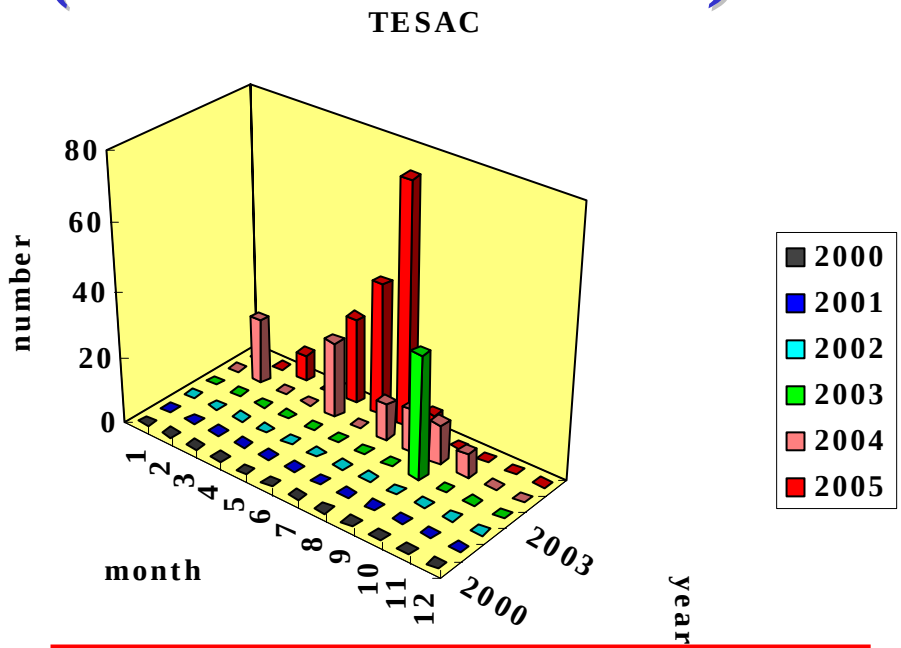
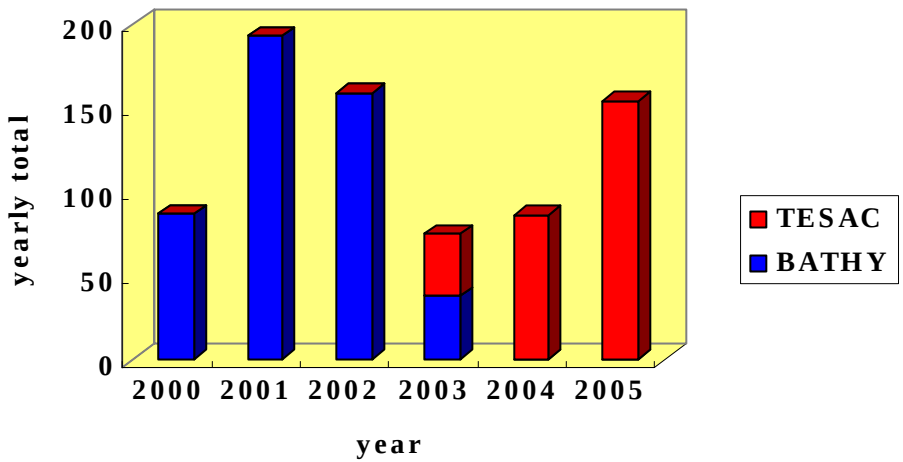


BATHY & TESAC message (R/V Wakataka-maru)







Since 2001, BATHY transfer has been automated.

Since the middle of 2003, TESAC transfer has been automated and the number is the same level with 2002 even the number was only totaled until August in 2004.

This increase is because of the transfer from biologists on R/V.

move the server to Tsukuba and now on the test

old address

http://tnfri2.myg.affrc.go.jp/FrontsysWeb/frontmap

new address

http://oceaninfo.dc.affrc.go.jp/ShipLAN-HKWeb/frontmap

Future Perspectives

1. automated data transfer from fisheries institute in prefecture

2. direct use of CTD data from R/V & prefecture

Now the ocean prediction model (JCOPE) uses TESAC/BATHY data from GTSPP. GTSPP data is quality controlled by Canada Marine Environmental Data Service (MEDS) and then delayed about a week from realtime. There is a possibility to shorten the delay by using the original data which is shared in realtime between ship and land.

realtime ocean information delivery system

model FRA-JCOPE

Prefectural Fisheries Institute

delivery to the world wide meteorological office thorough GTS

automated data transfer

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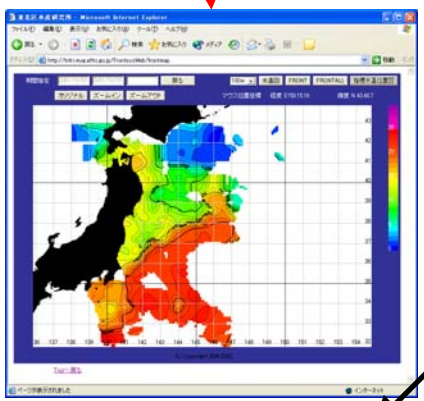

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