

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

Shin-ichi Ito, Shigeo Kakehi, Motohiko Kashima TNFRI, FRA
 Yoshiaki Ozeki NRISF, FRA
 Kazuyuki Uehara NRISF, FRA

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

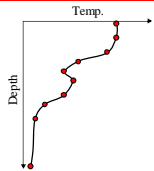
Current situation of land-ship data transfer

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,

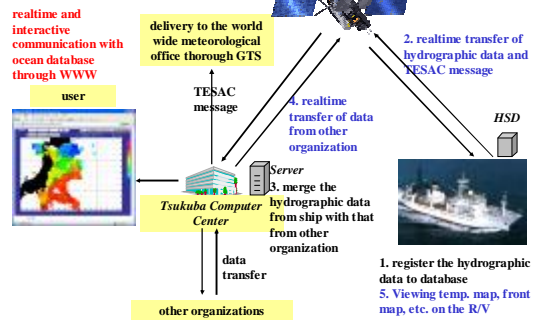
because the meanings is insufficiently understood, shortage of the knowledge about transfer form the communication apparatus is not equipped the profits reduction to data provider is not apparent



objective

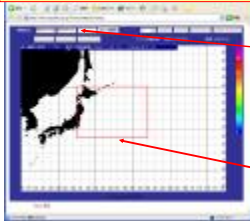
1. enable two-way data transfer
2. gather the rate of BATHY/TESAC transfer

realtime ocean information delivery system



realtime ocean information delivery system

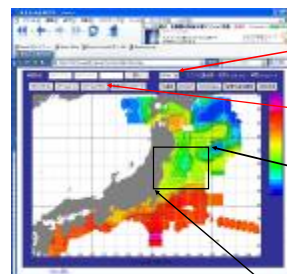
Database: IBM DB2
 Web server: land: IBM WebSphere, ship: Tomcat
 synchronism: exchange only updated portion in DB2 through http protocol
 Server: land: Tsukuba computer center (Linux)
 ship: Note PC (Windows)



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.

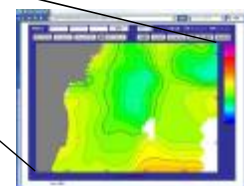
display of temperature map



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

Button to extract strong temperature region.

Tsugaru Warm Water Front

Oyashio Front

Front around cold eddy

Kuroshio Extension Front

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.

Button to extract to jpeg file.

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

