The Frame-Grabber System for Integrated Content and Data Access

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INMARTECH, October 18, 2006

Frame-Grabber Background

- Originally Developed for ROV, HOV, AUVs
  - ROV Jason VirtualVan
  - HOV Alvin FrameGrabber
  - AUV SeaBed
- Ship Data-Grabber
  - Installed on Atlantis, Knorr, Oceanus, Tioga
  - Shore repository for underway data
- ExView
  - Developed for Latte06 and SW06 experiments
  - Test collaboration tools

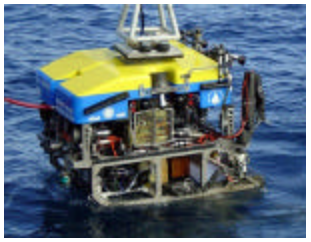
Frame-Grabber Overview

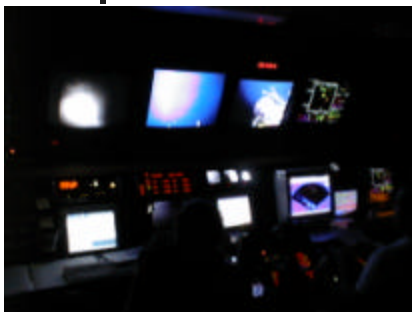
- Snapshot integrated data/information at regular intervals
- UDP-based Data Delivery
- Provide a simple web front-end for users on-ship and on-shore (post-cruise)
- Simple ASCII Data Format (EIC,CSV,XML)
- Built-in navigation tools for time, event, and geographic indexing

Philosophy

- Complement existing Data Acquisition Systems
- Snapshot real-time integrated data
- Provide composite view of data (templates)
- Provide real-time displays for Q/A
- Simple web-based capabilities for on-ship and on-shore
- Self-contained on-ship, take advantage of Satellite-Communications where available
- Minimal support required to operate system

ROV Jason VirtualVan

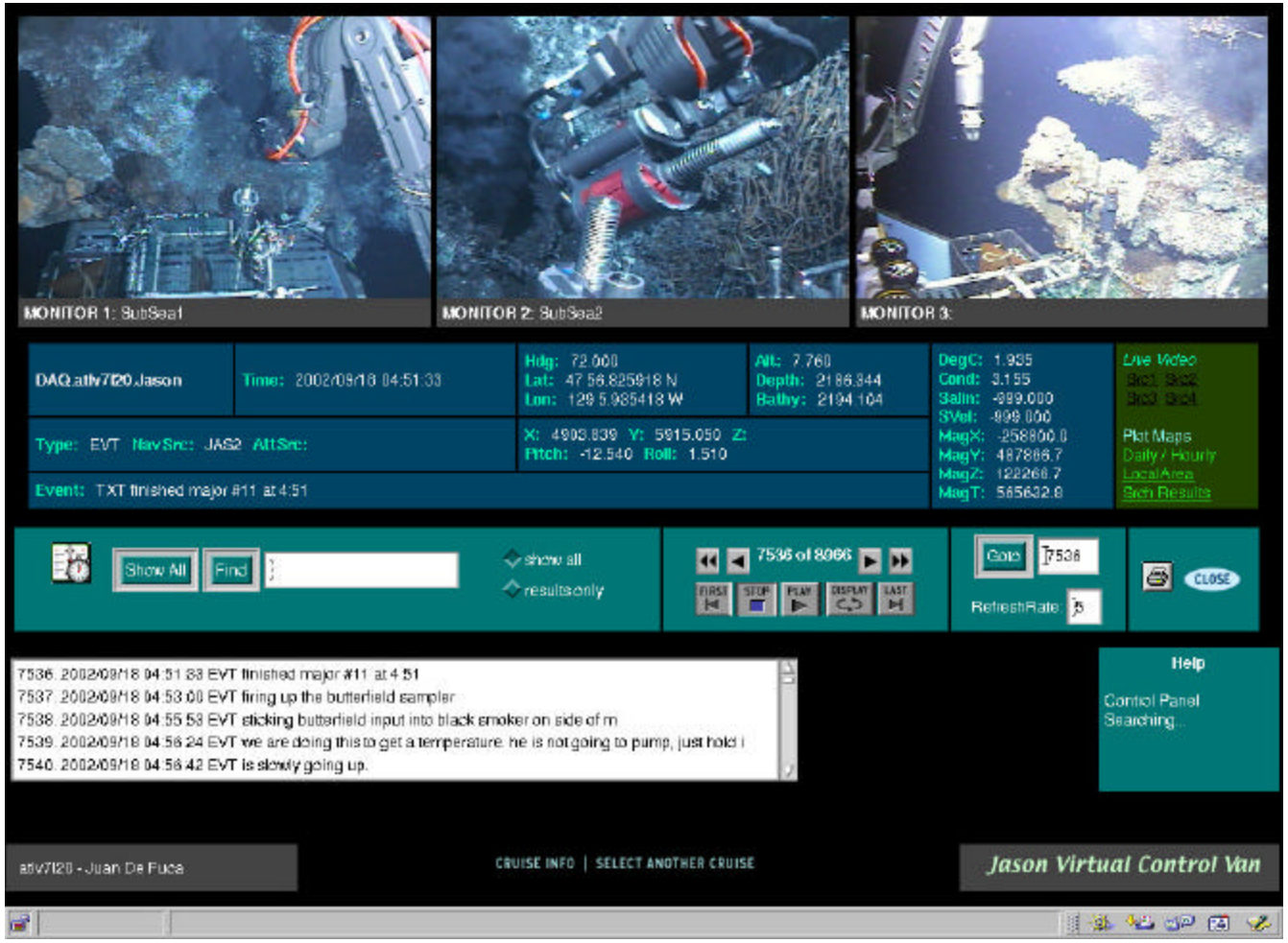




Control-Van

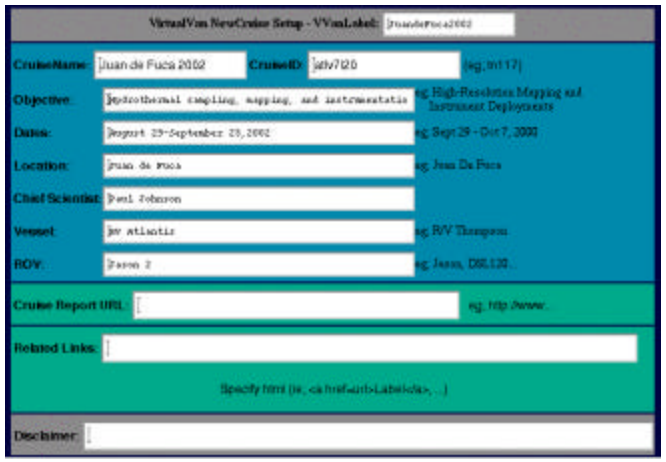
Snapshot

- Video Displays
- Navigation
- Vehicle Telemetry
- Science Instruments
- User Events

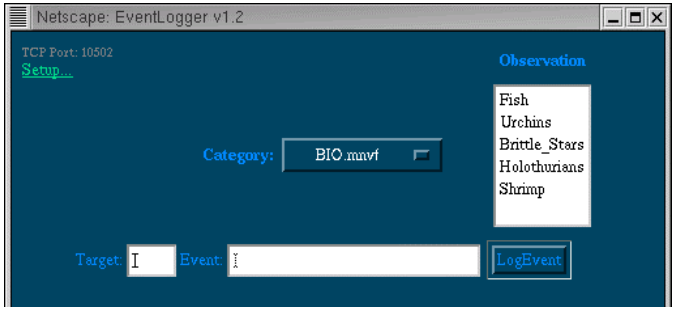


VirtualVan user web-interface

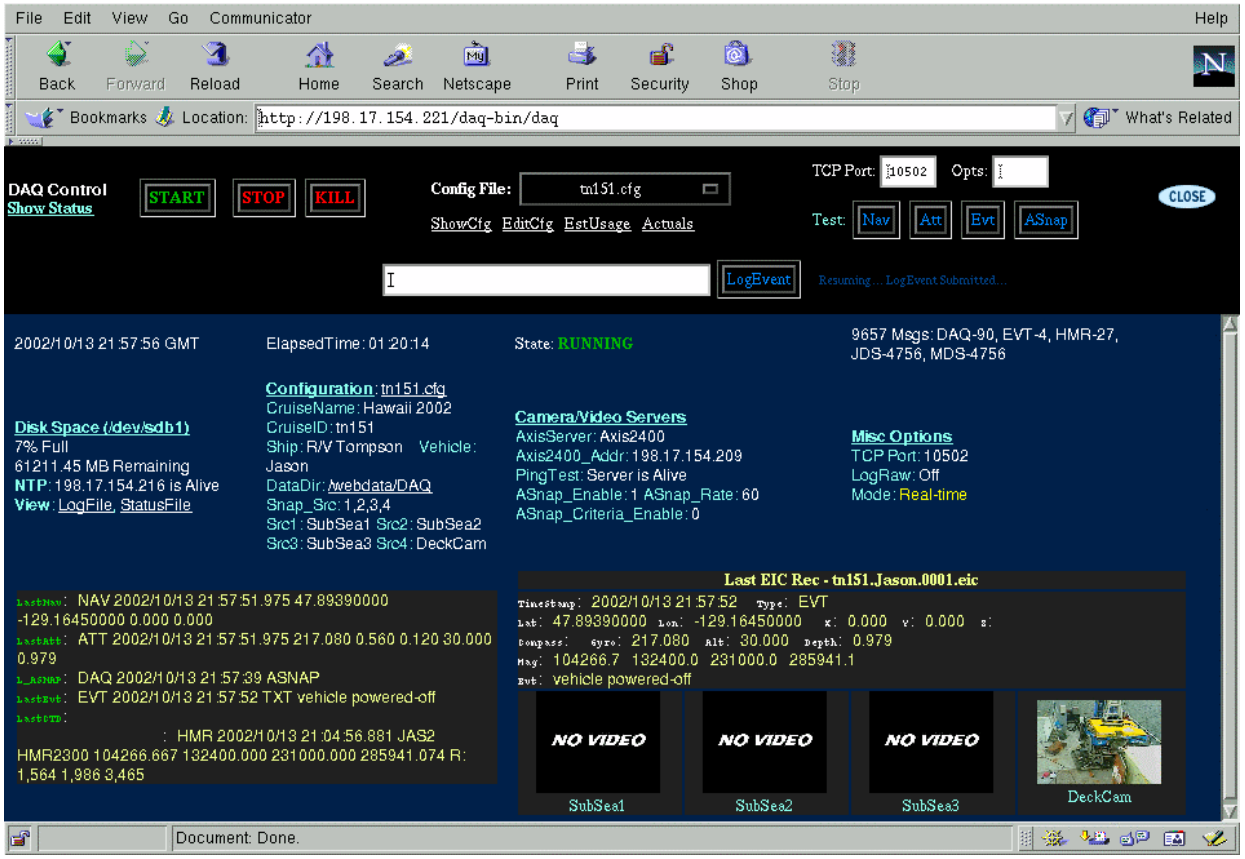
ROV Jason VirtualVan



New Cruise Form



Web-based Event Logger

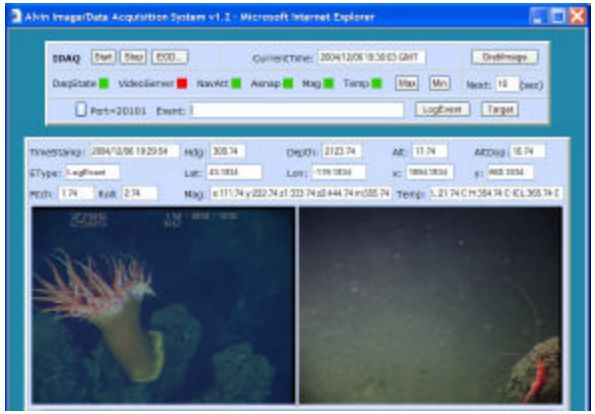


Acquisition Screen

DSV Alvin Frame-Grabber

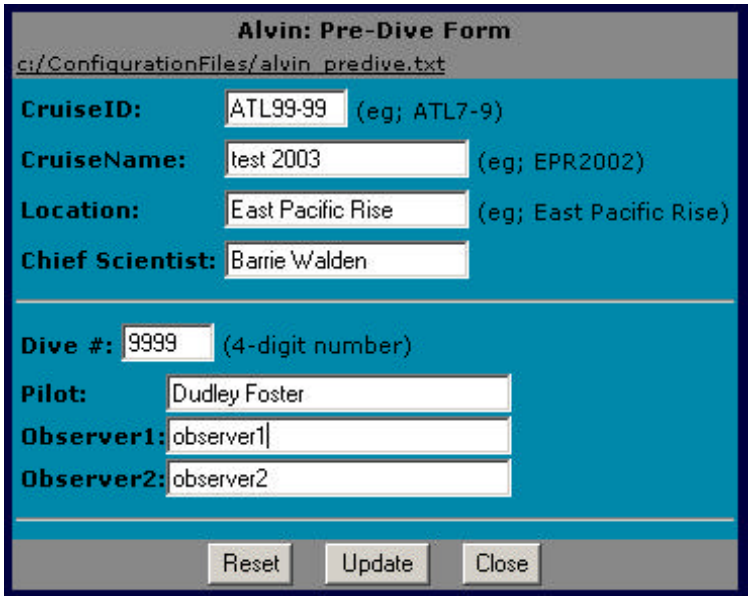
DSV Alvin

User Interface

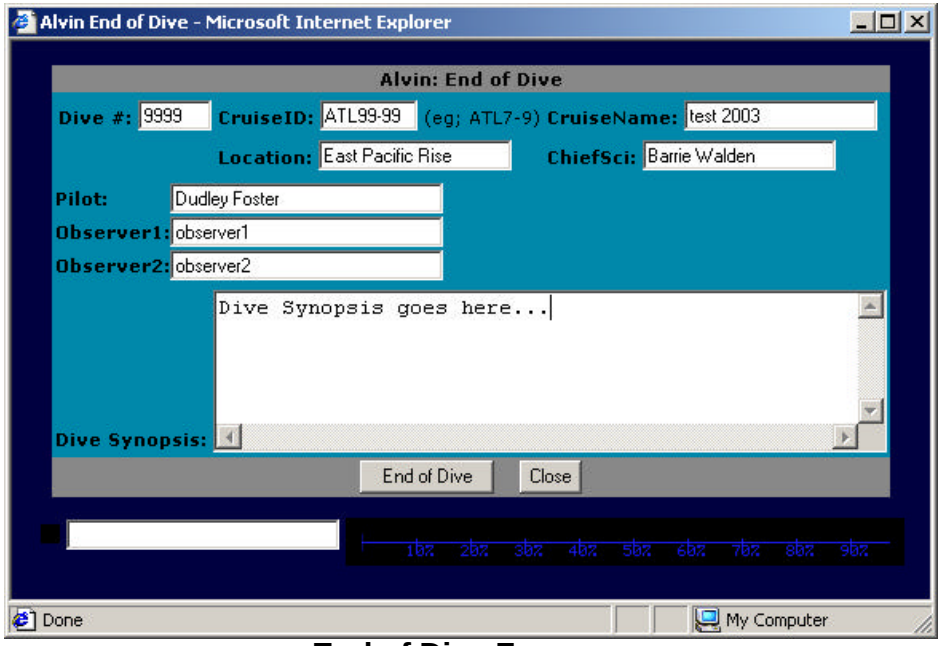


Acquisition System

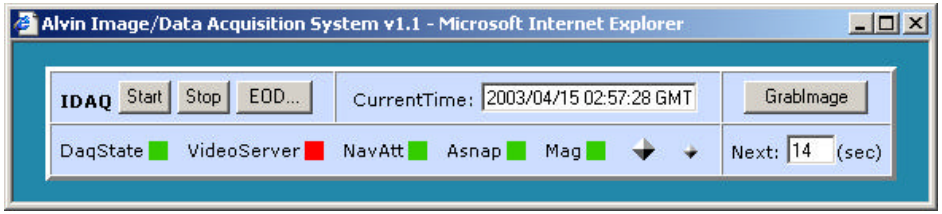
DSV Alvin Frame-Grabber



Pre-Dive Form

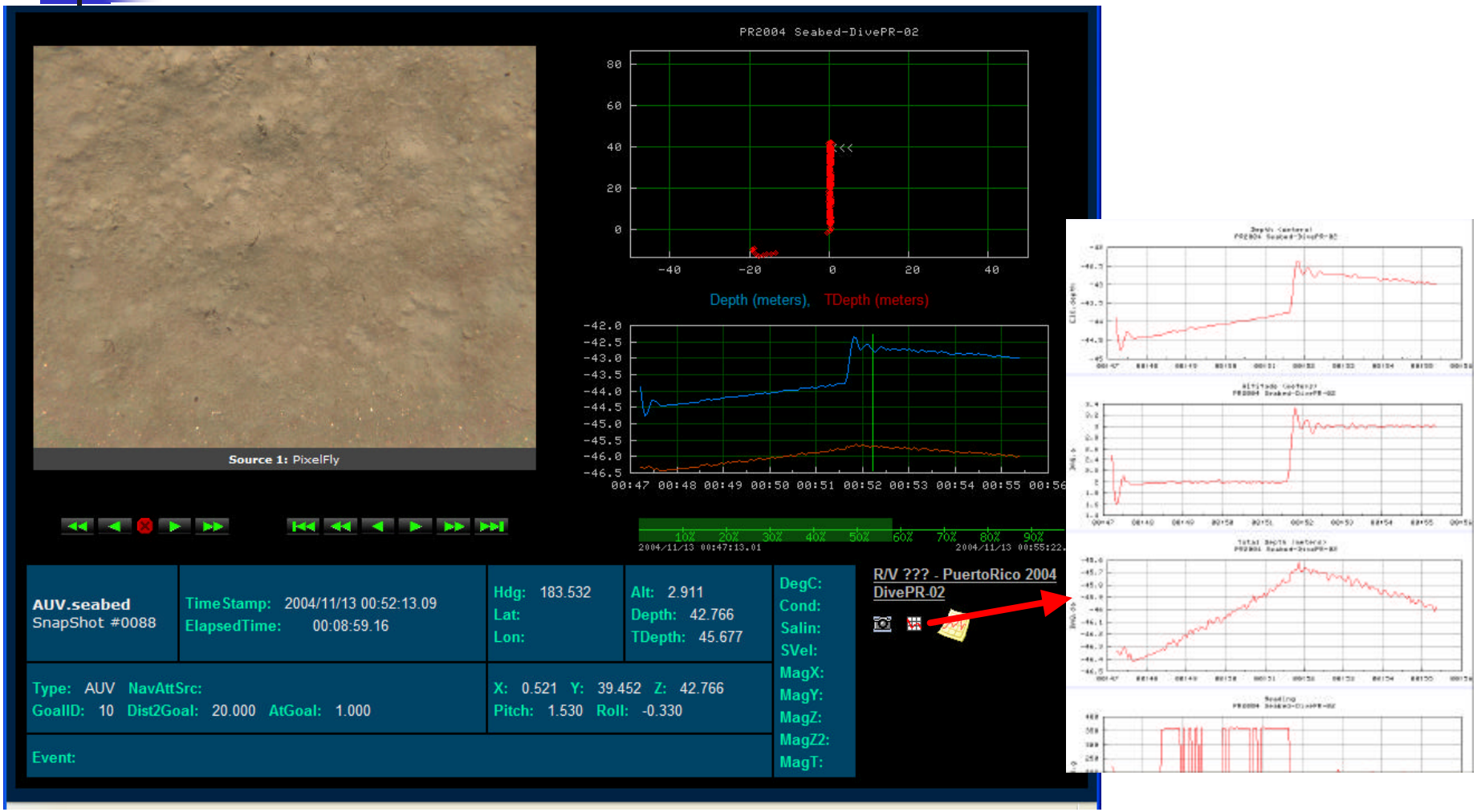


End of Dive Form



Acquisition Status Display

AUV SeaBed DataAccess



Ship DataGrabber

- Features/Capabilities:
  - UDP data delivery from Calliope
  - Minimal operations support required
  - Interactive time-series/geographic plots
  - Real-time display and data statistics for Q/A
  - Data Dictionary/Real-time SDG data format
  - Interface with web-based EventLogger
  - On-shore repository
  - Web-Based user interface
  - R/T Data Communications to shore (SW06/Future)
  - Links to on-line Data and increased interoperability (Future)

Ship DataGrabber – Acquisition

R/V Atlantis: *Ship DataGrabber System - v2.2*

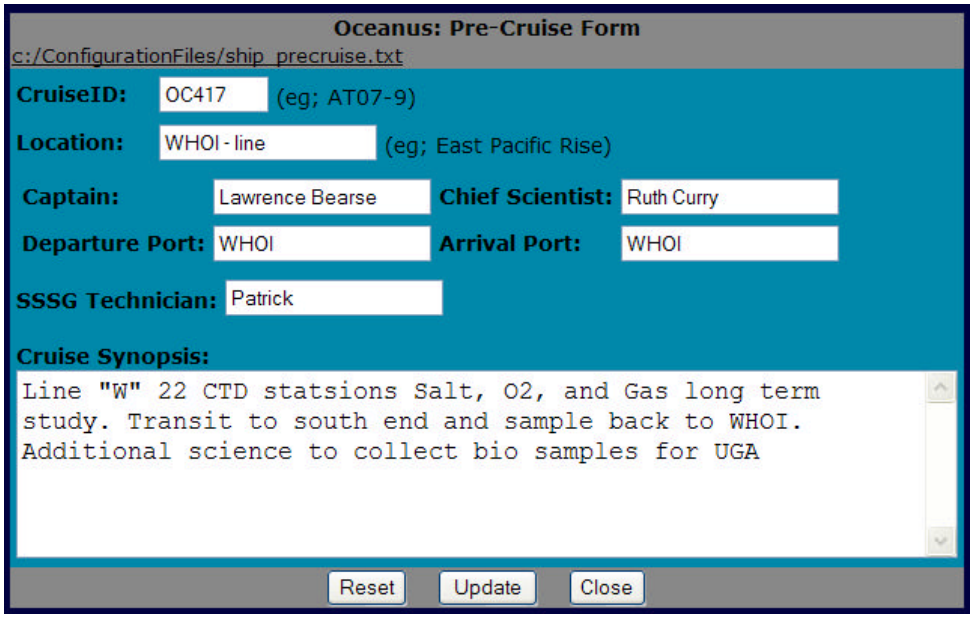
- Pre-Cruise Form
- Image/Data Acquisition
- Update Cruise HTML
- Event Logger
- View: R/T Data Display, ActiveCruise
- View: Interactive Data Viewer
- View: Other Atlantis Cruises

For testing: UDP Read, UDP Write

Ship DataGrabber – Pre-Cruise

Step 1:
Fill-out Pre-Cruise Form

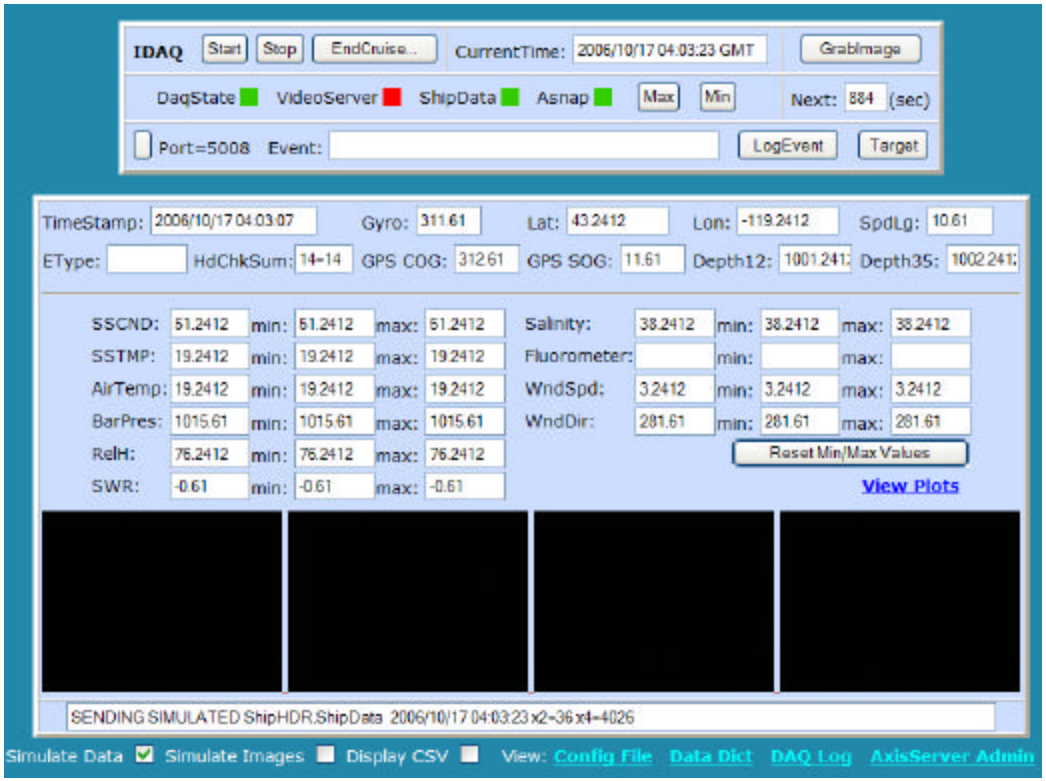
The Pre-Cruise Form provides basic cruise meta-data such as CruiseID, Location, Captain, Chief Scientist, etc. The intent is to keep this to a minimum while providing useful information.



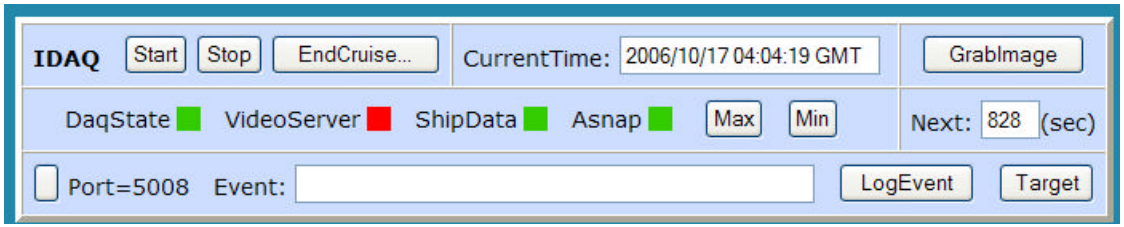
Ship DataGrabber – Acquisition

Step 2:

Start the acquisition process and check for green lights and valid data



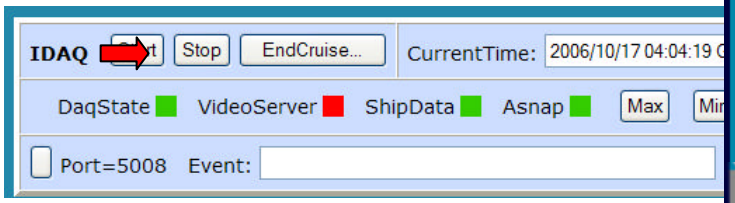
Minimize Acquisition Status Display

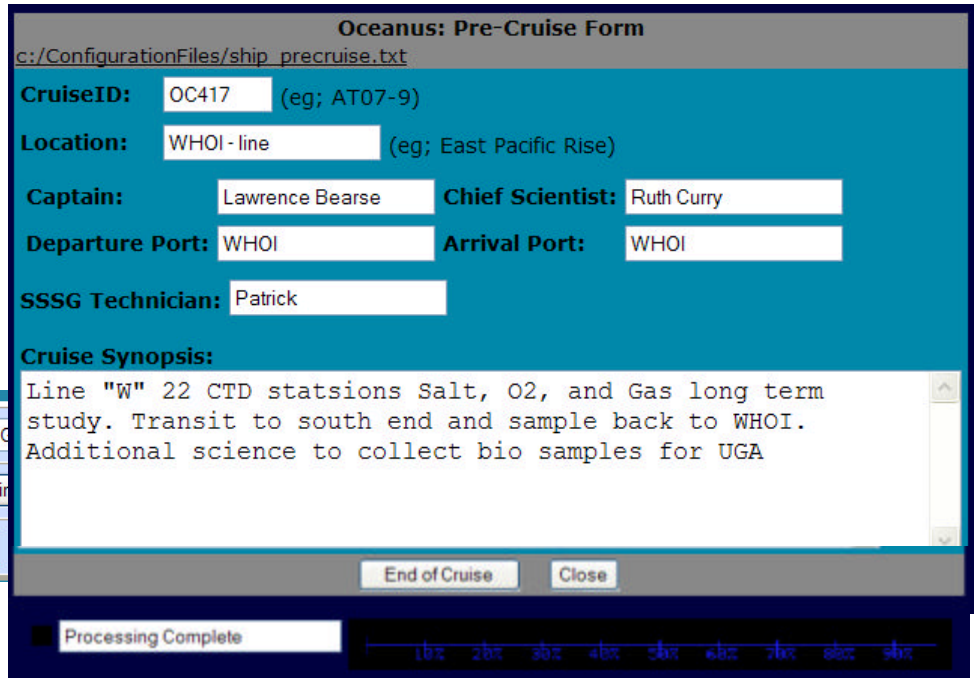


Ship DataGrabber – End Cruise

Step 3:

At the End of Cruise, press the ‘Stop’ button and click ‘EndCruise’ to display the End of Cruise form.





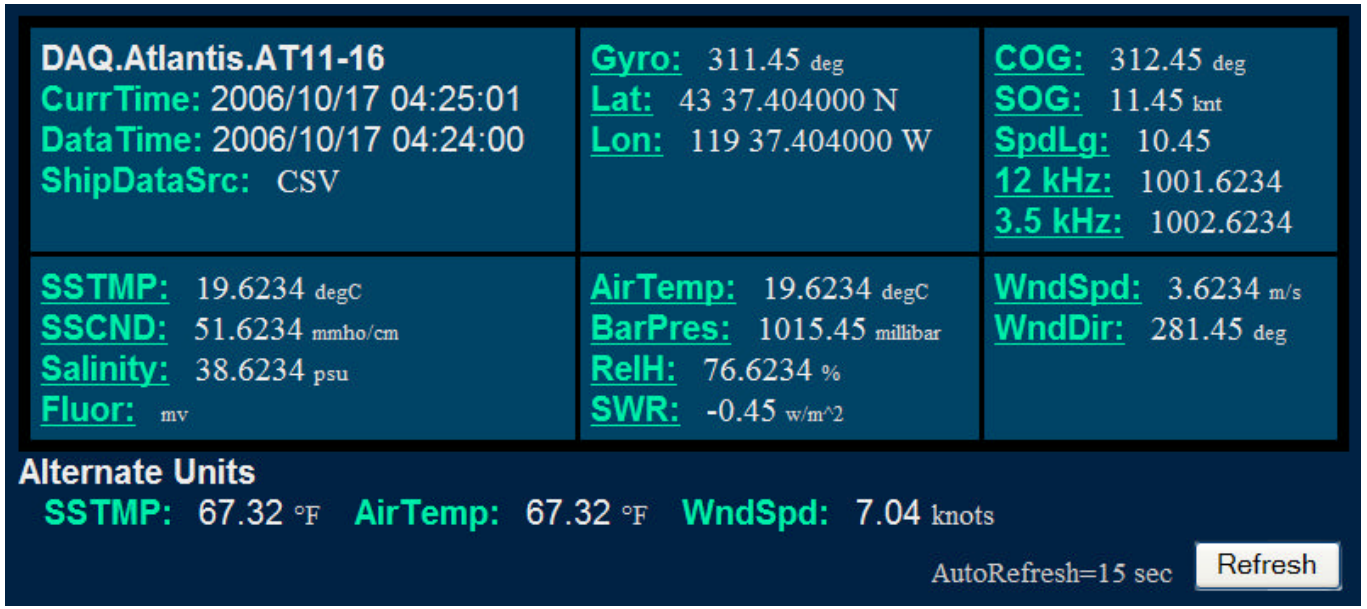
The End of Cruise Form contains the information entered from the pre-cruise form and archives the dataset when the ‘End of Cruise’ button is pressed.

Ship DataGrabber – User Options

R/V Atlantis: ***Underway Ship Data***
CruiseID: AT11-16

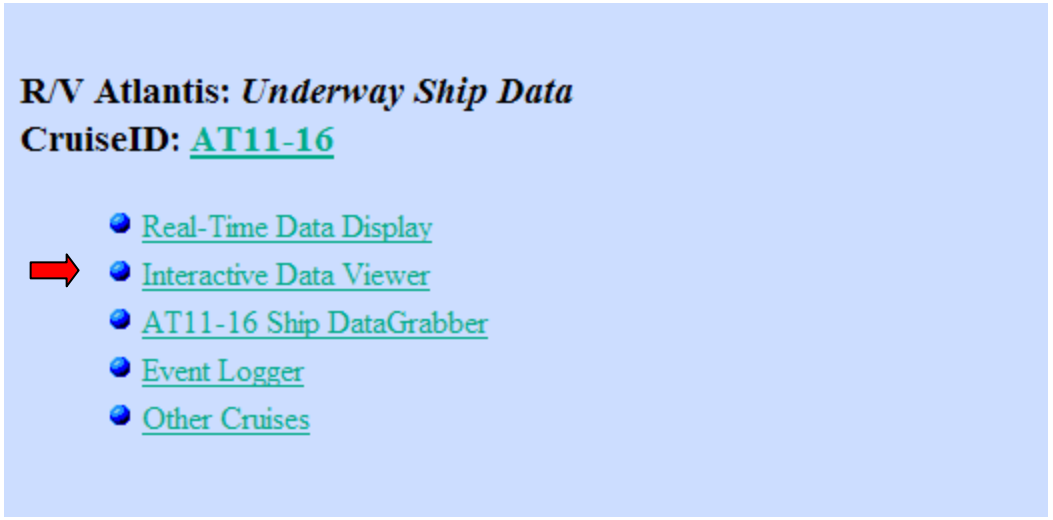
- Real-Time Data Display
- Interactive Data Viewer
- AT11-16 Ship DataGrabber
- Event Logger
- Other Cruises

Ship DataGrabber – R/T Display

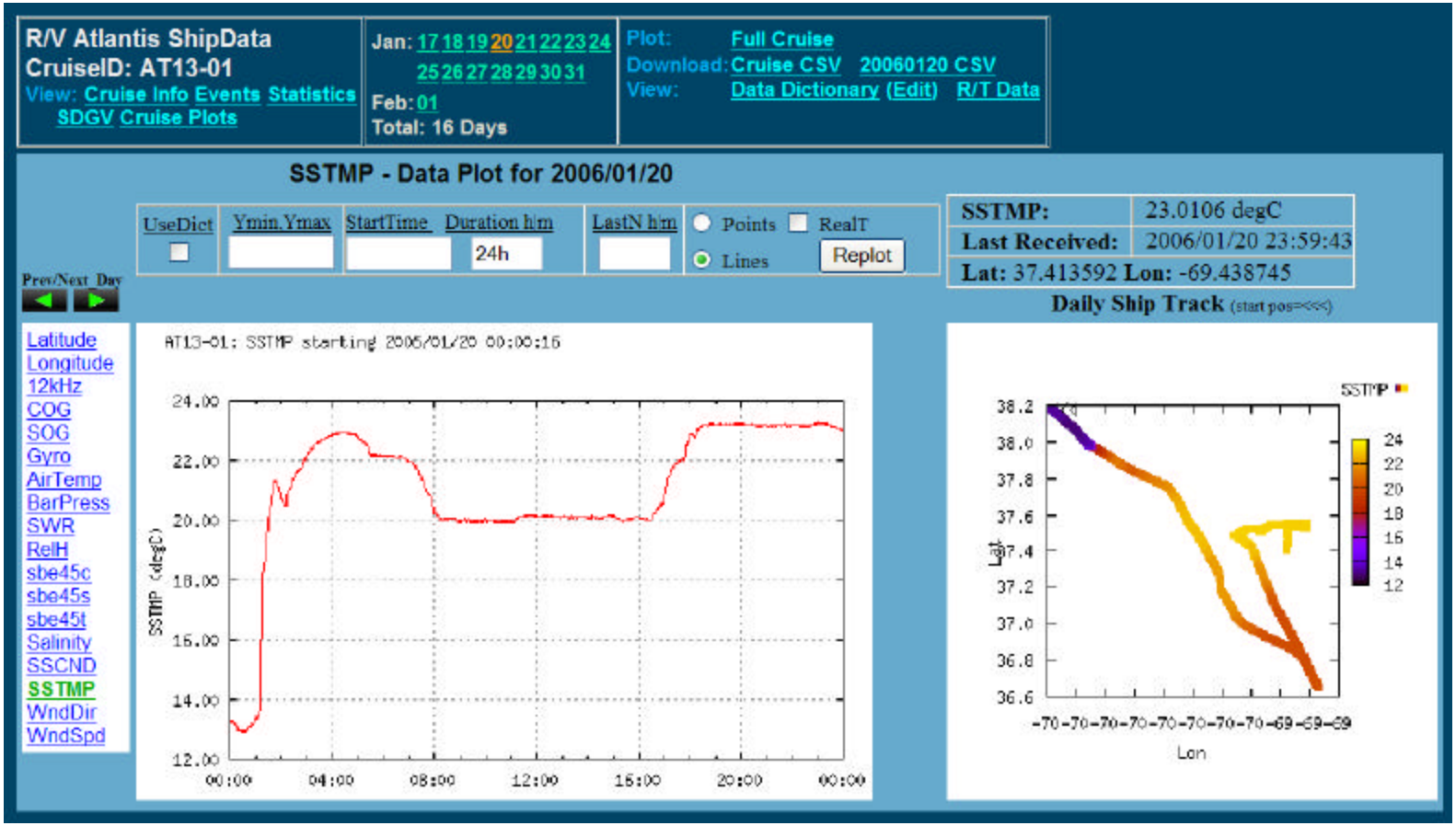


Real-time Web-Based Data Display

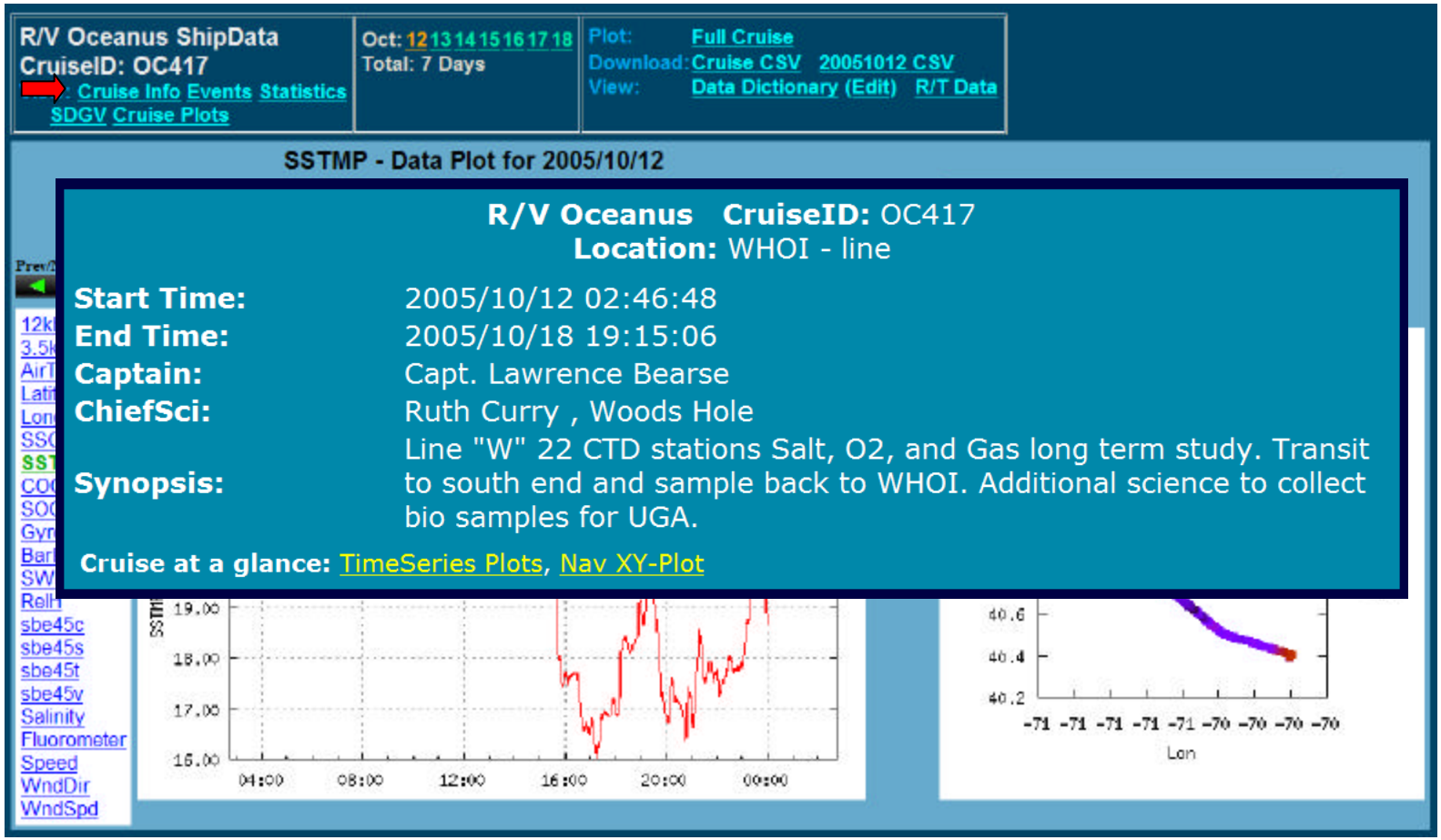
Ship DataGrabber – User Options



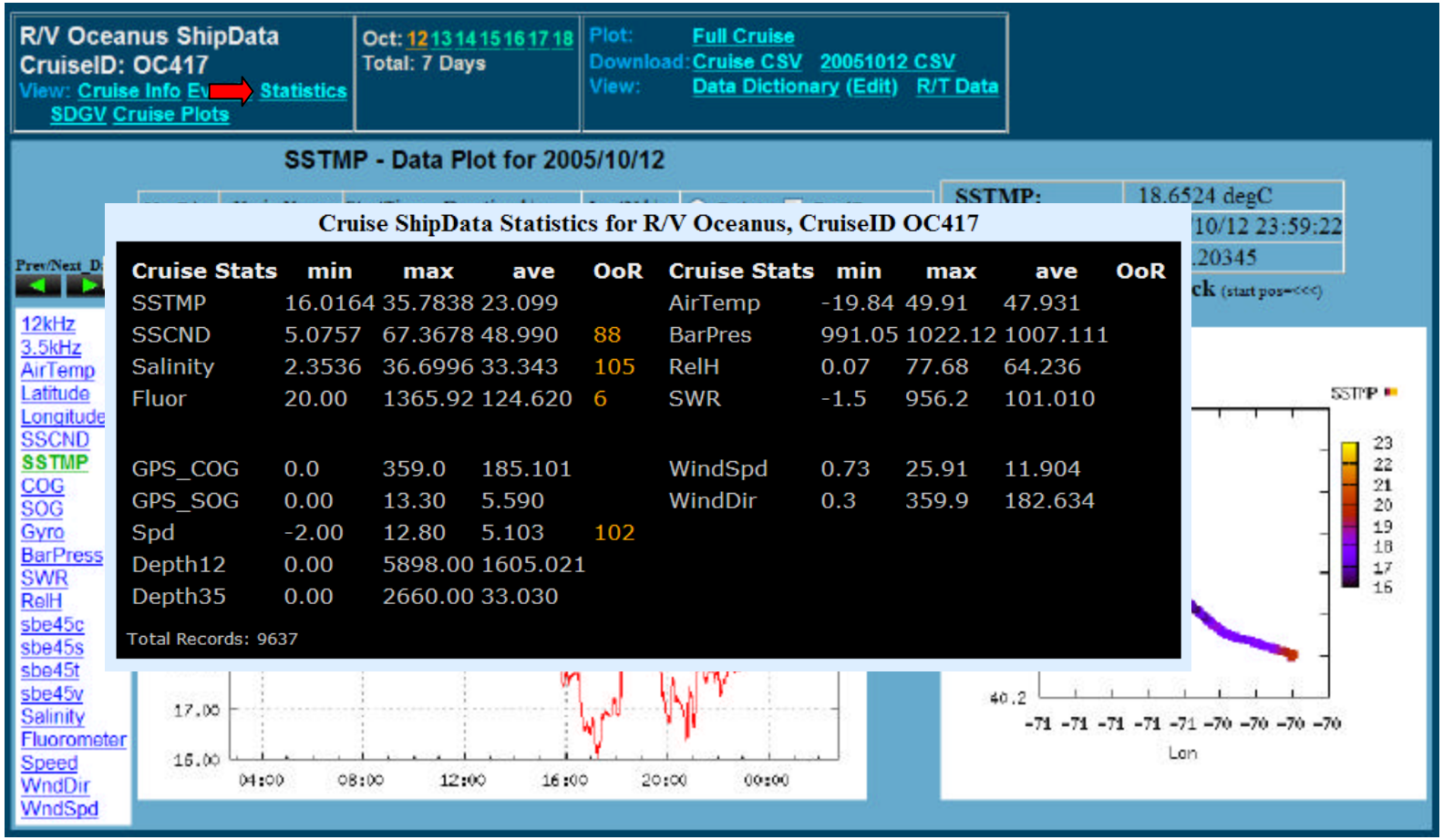
Ship DataGrabber – Interactive Plots



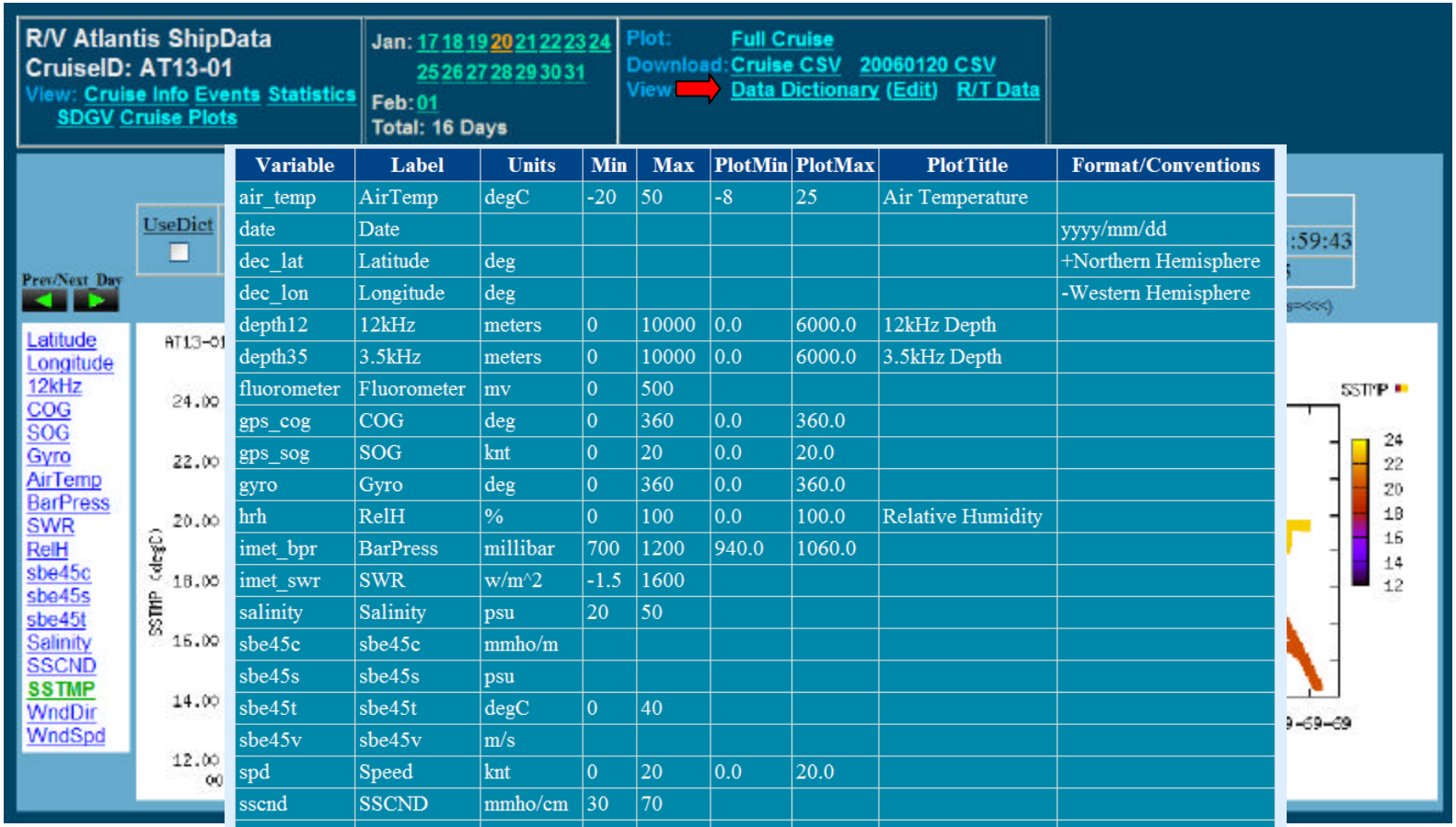
Ship DataGrabber – Cruise Info



Ship DataGrabber – Statistics

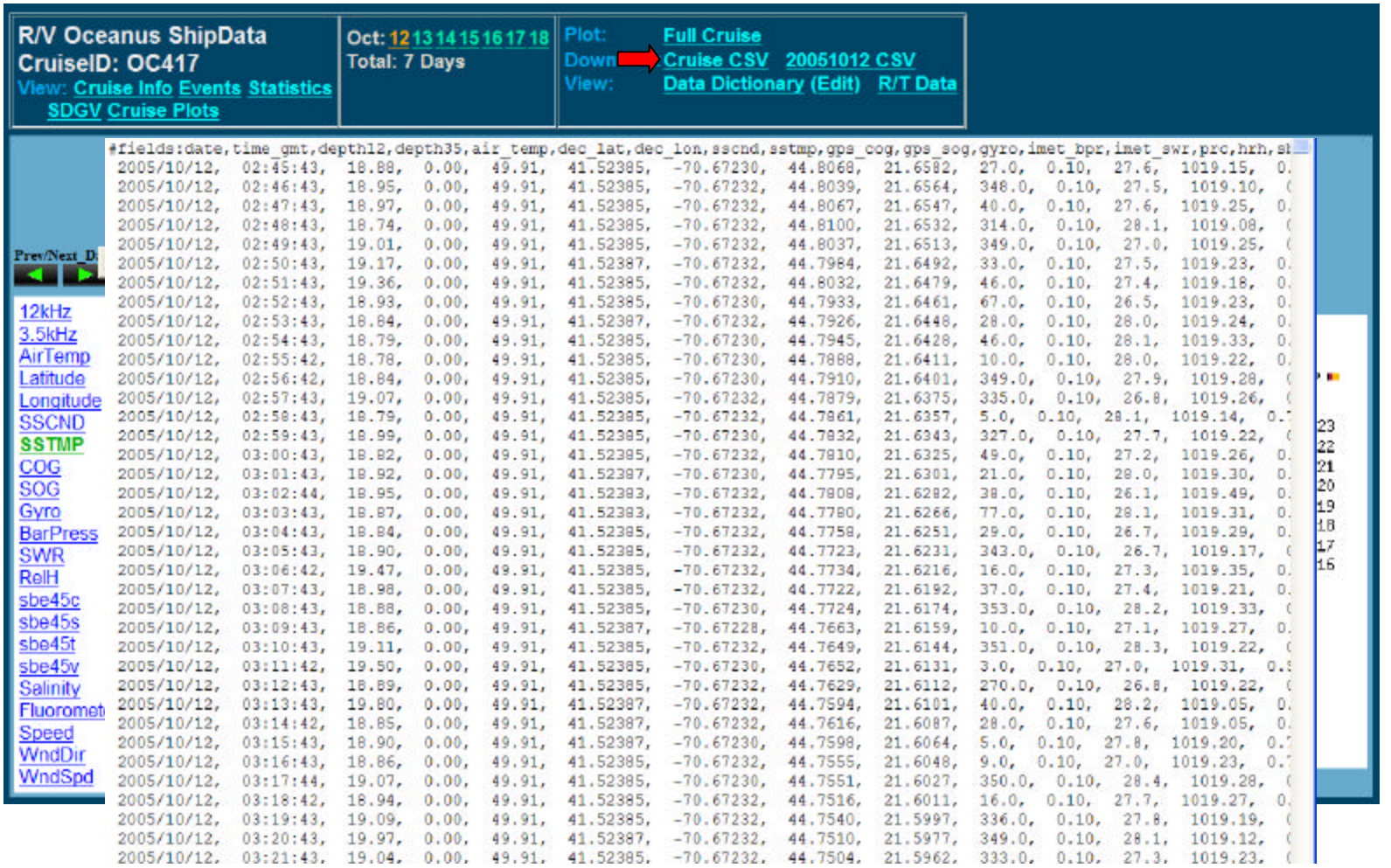


Ship DataGrabber – Data Dictionary

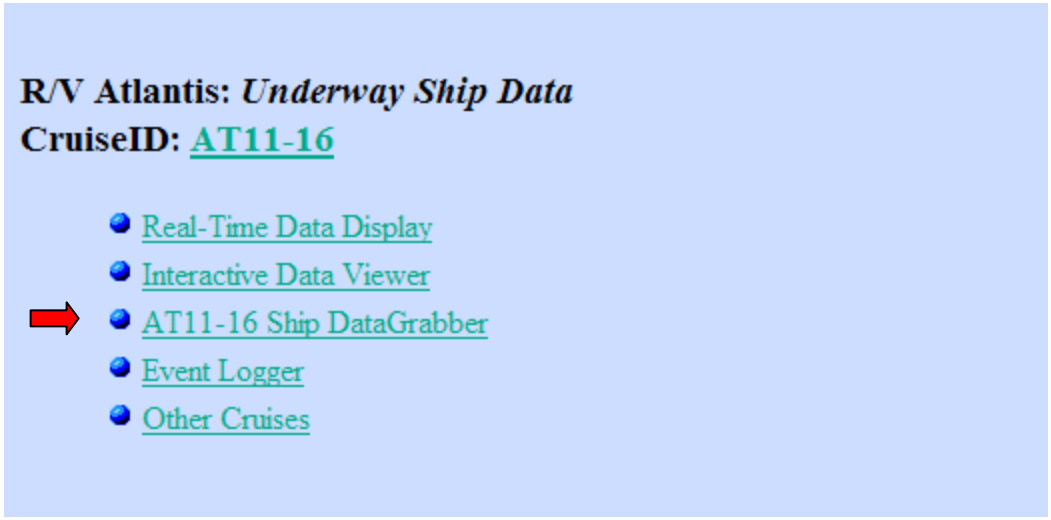


Variable	Label	Units	Min	Max	PlotMin	PlotMax	PlotTitle	Format/Conventions
air_temp	AirTemp	degC	-20	50	-8	25	Air Temperature	
date	Date							yyyy/mm/dd
dec_lat	Latitude	deg						+Northern Hemisphere
dec_lon	Longitude	deg						-Western Hemisphere
depth12	12kHz	meters	0	10000	0.0	6000.0	12kHz Depth	
depth35	3.5kHz	meters	0	10000	0.0	6000.0	3.5kHz Depth	
fluorometer	Fluorometer	mv	0	500				
gps_cog	COG	deg	0	360	0.0	360.0		
gps_sog	SOG	knt	0	20	0.0	20.0		
gyro	Gyro	deg	0	360	0.0	360.0		
hrh	RelH	%	0	100	0.0	100.0	Relative Humidity	
imet_bpr	BarPress	millibar	700	1200	940.0	1060.0		
imet_swr	SWR	w/m^2	-1.5	1600				
salinity	Salinity	psu	20	50				
sbe45c	sbe45c	mmho/m						
sbe45s	sbe45s	psu						
sbe45t	sbe45t	degC	0	40				
sbe45v	sbe45v	m/s						
spd	Speed	knt	0	20	0.0	20.0		
sscnd	SSCND	mmho/cm	30	70				
sstmp	SSTMP	degC	0	40				
time	Time							hh:mm:ss (GMT)

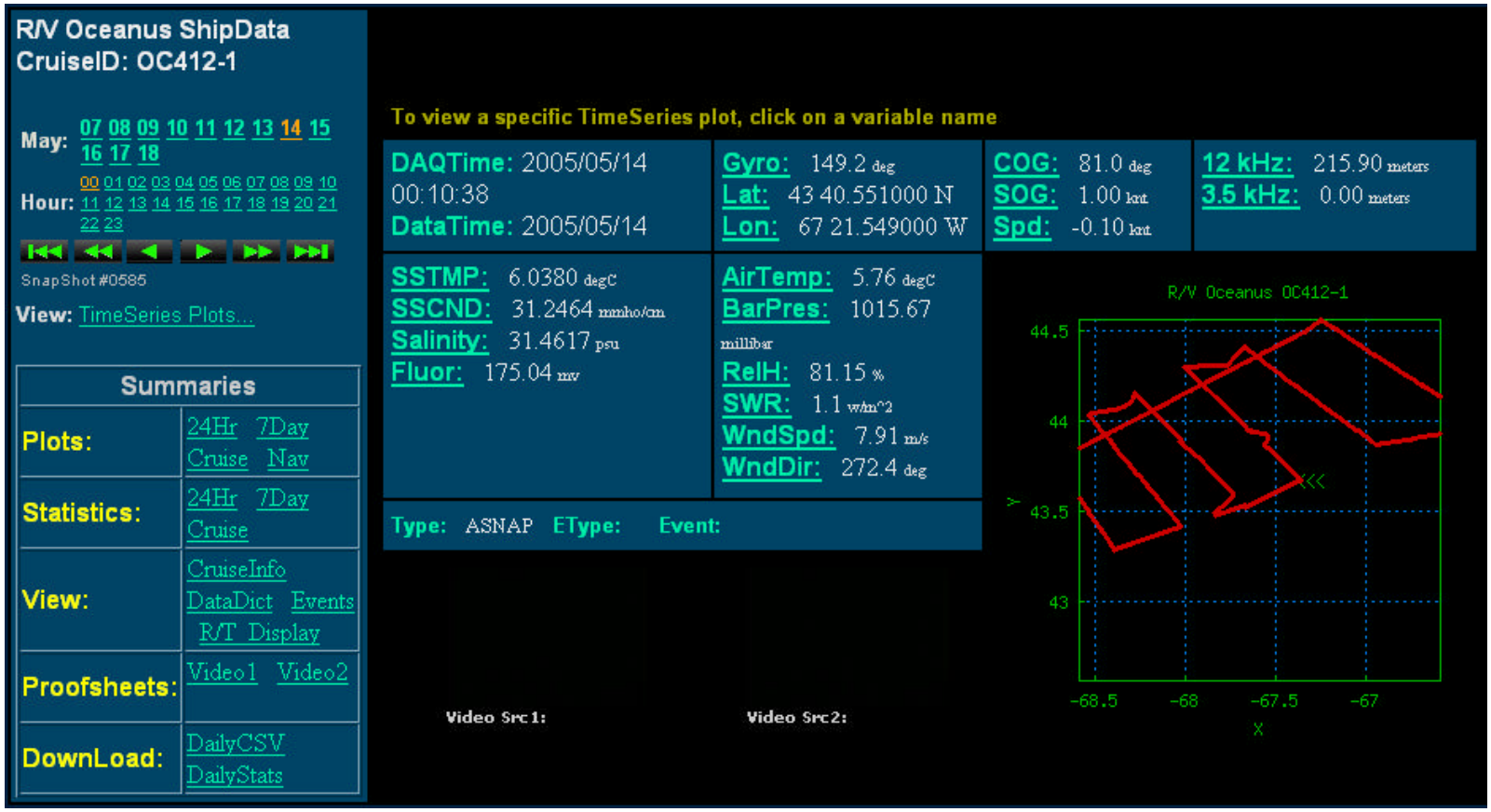
Ship DataGrabber – Download CSV



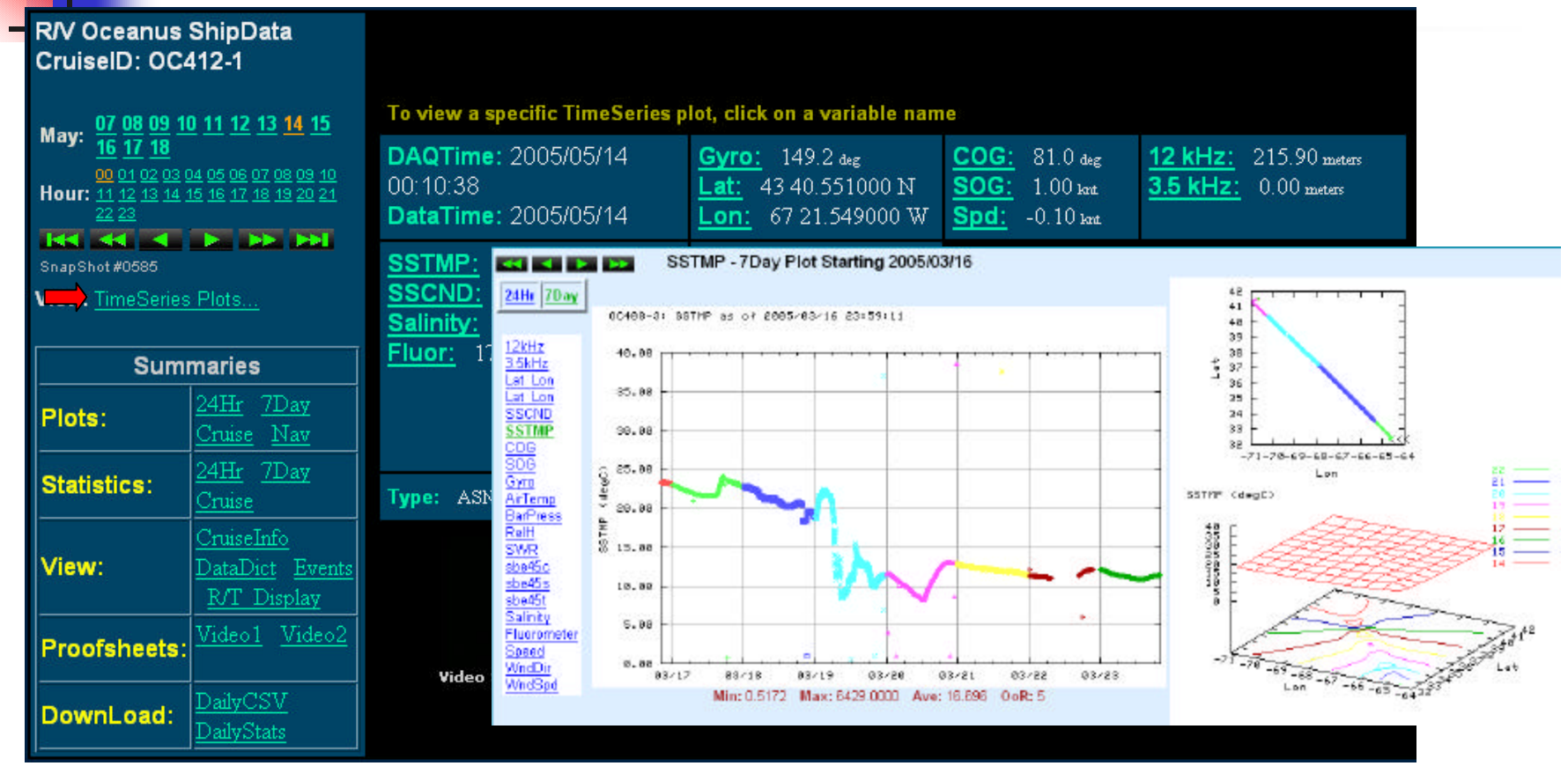
Ship DataGrabber – User Options



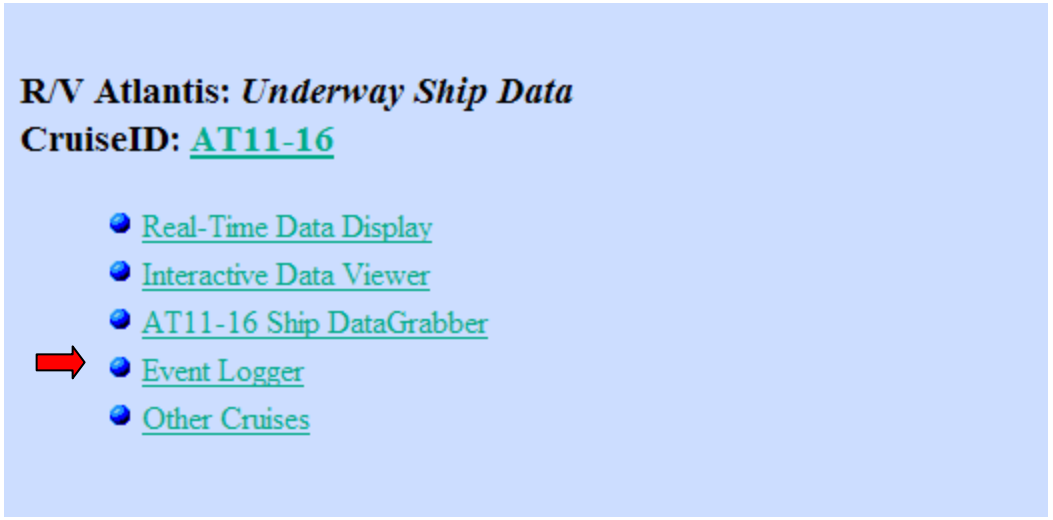
Ship Data – Integrated Display



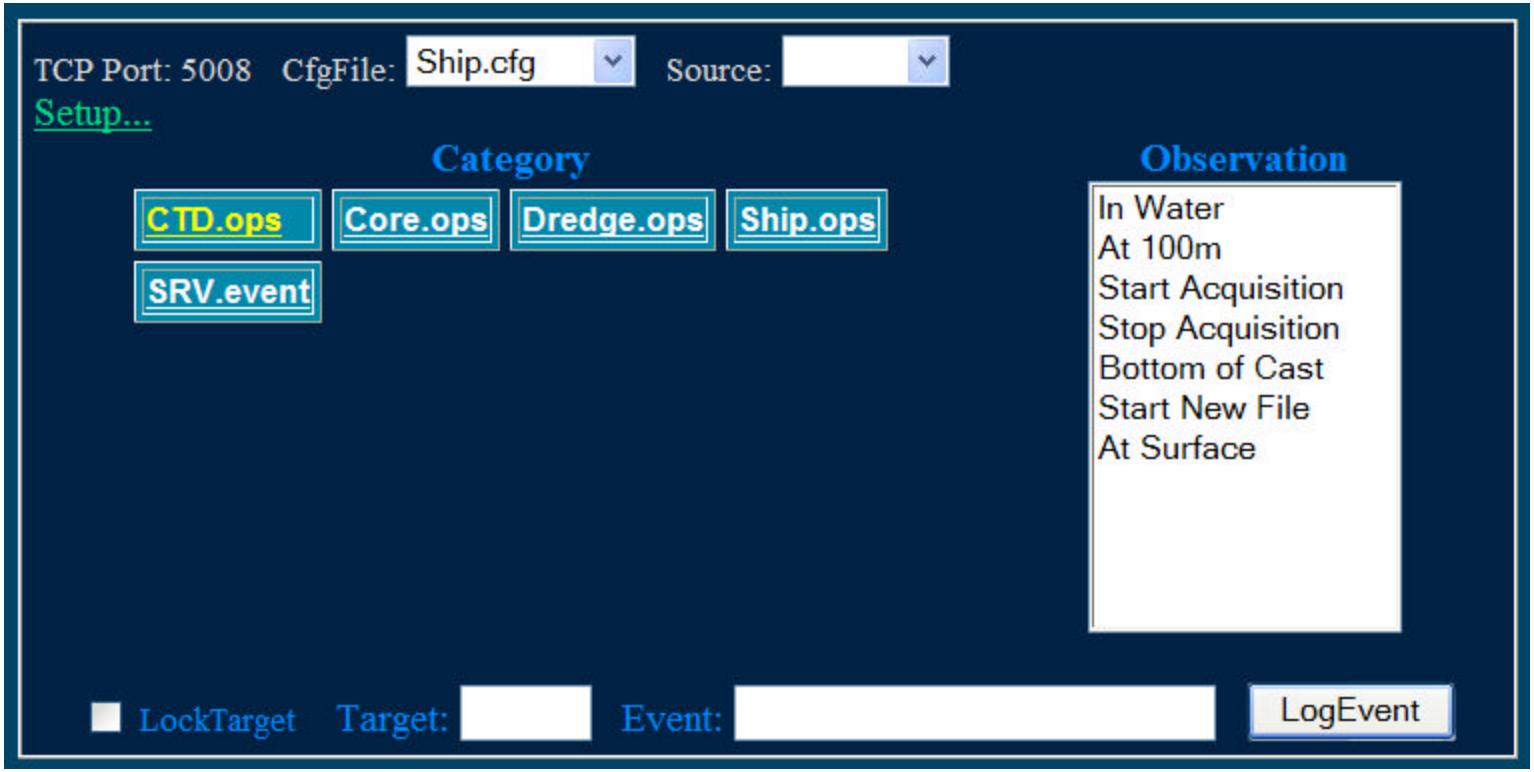
Ship Data – Multi-Variable Plots



Ship DataGrabber – User Options

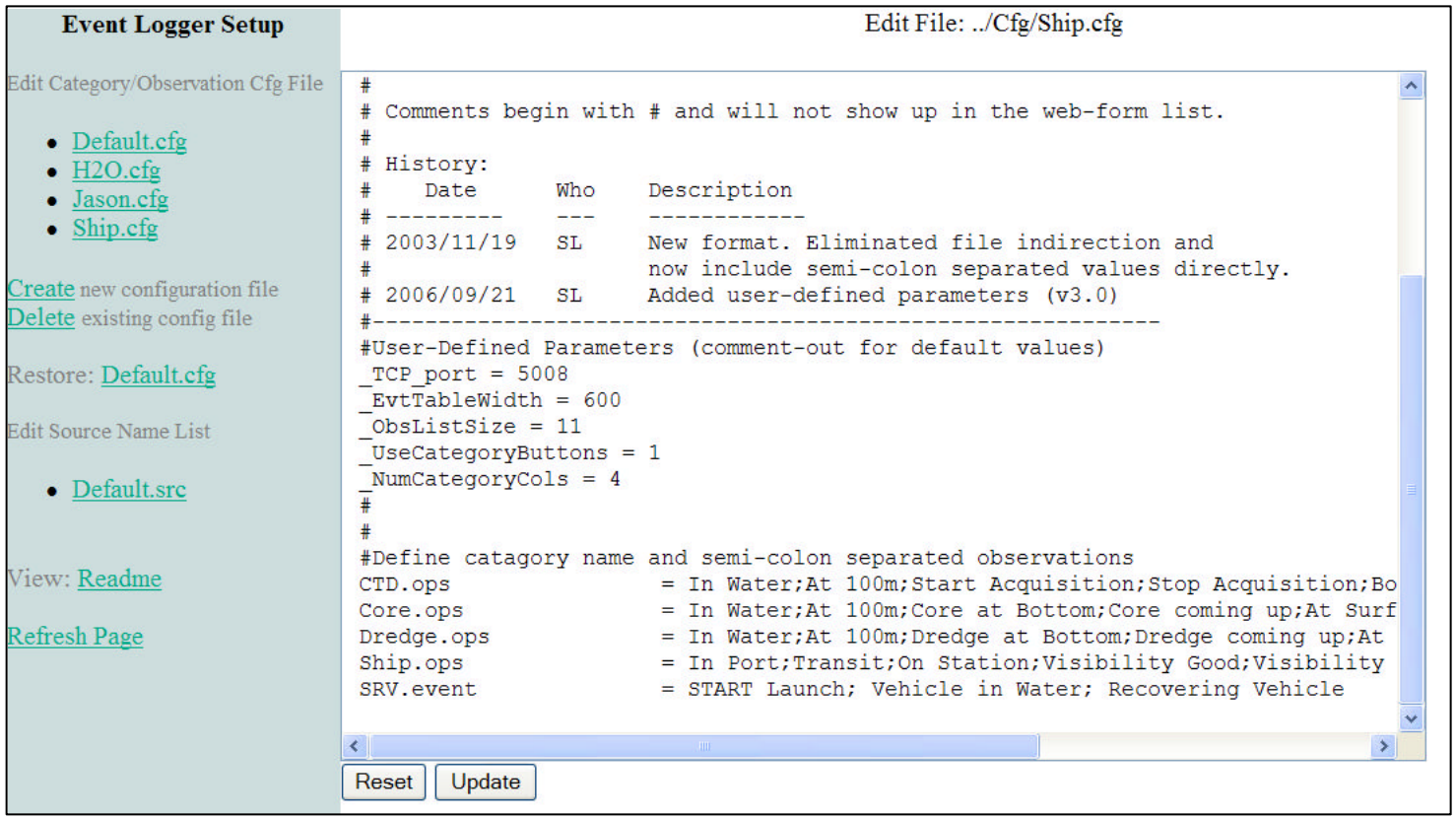


Ship DataGrabber – Event Logger



Web-Based Event Logger System

Ship DataGrabber – Event Logger



Event Logger - User Configurable

Ship Data-Grabber – Shore Server

WHOI Ship Data-Grabber System

Overview | Ship Data | Architecture | User Interface | Documentation


R/V Atlantis


R/V Knorr


R/V Oceanus


R/V Tioga

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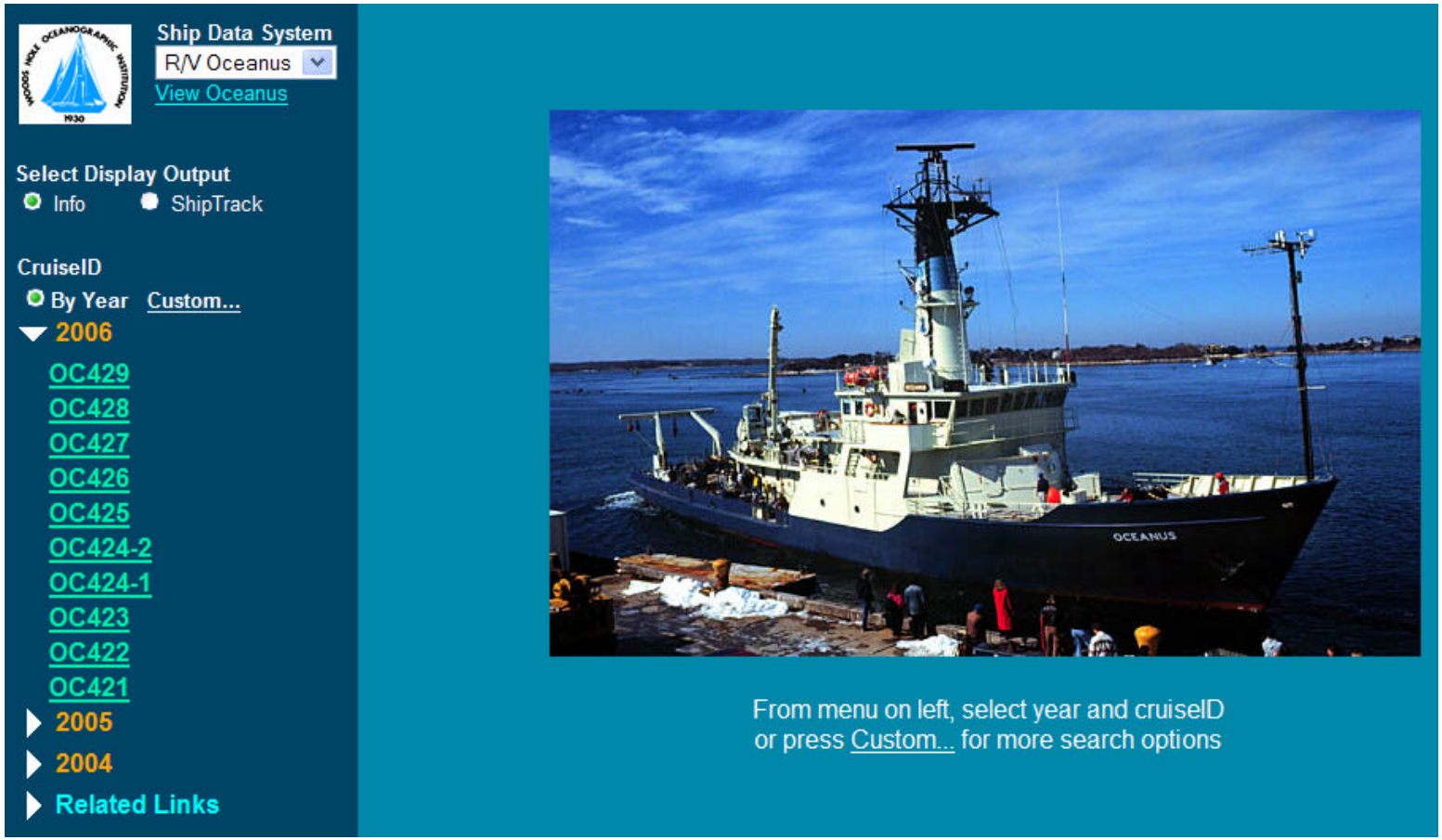
URL: www.whoi.edu and click-on ‘Digital Data Center’

ShipData – R/V Oceanus



ShipData – Cruise Info/Metadata

Ship Data System
R/V Oceanus
View Oceanus

Select Display Output
Info ShipTrack

CruiseID
By Year Custom...
2006
OC429
OC428
OC427
OC426
OC425
OC424-2
OC424-1
OC423
OC422
OC421
2005
2004
Related Links

View: Cruise Summary List
Goto: ShipData Home

R/V Oceanus CruiseID: OC429 Location: New Jersey Shelf

Cruise Info

CruiseID:	OC429
Captain:	Capt. Lawrence Bearse
Chief Sci:	John Kemp Woods Hole
Location:	New Jersey Shelf
DeparturePort:	Woods Hole
ArrivePort:	Woods Hole
StartTime:	2006/09/07 11:10:32
EndTime:	2006/09/12 13:40:25

View Ship Track Image

Underway Data Collected

Sensors:
depth12, depth35, air_temp, dec_lat, dec_lon, sscnd, sstmp, gps_cog, gps_sog, gyro, imet_bpr, imet_swr, prc, hrh, sbe45c, sbe45s, sbe45t, sbe45v, salinity, fluorometer, spd, wnd_dir, wnd_spd
View: DataViewer, SDG, QuickPlots

Bathymetry Data Collected

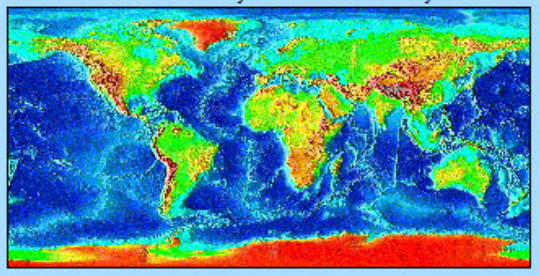
Other Data Viewers

CTD Viewer

Download Archived Data...

Synopsis

The main scientific research objective is the recovery of subsurface moorings. The planned activities include multiple mooring recoveries. The operations area will be off the New Jersey coast in the vicinity of 39o 10'N, 73o 00'W.

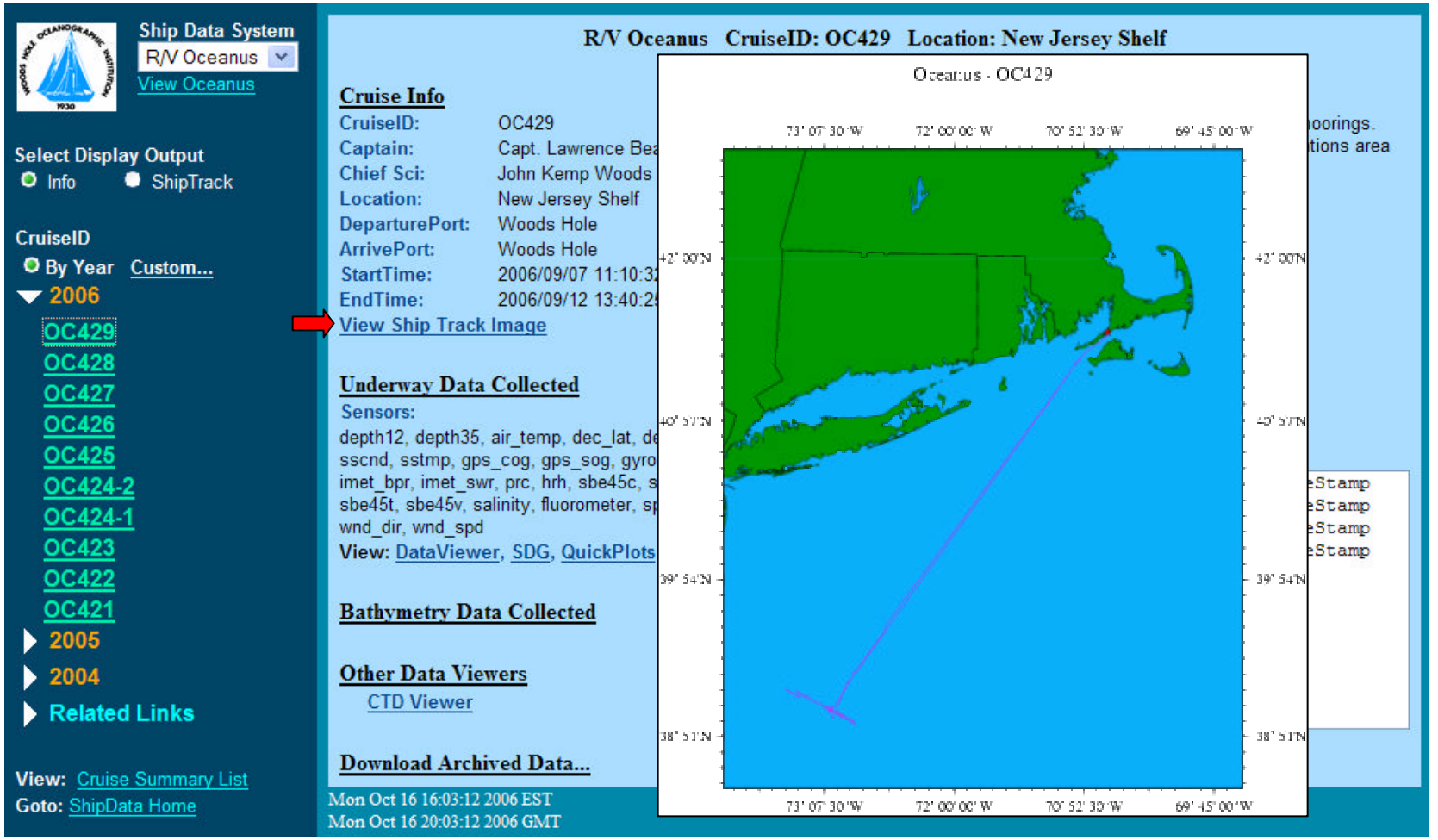


Event Summary: 0 CTDs, 0 Cores, 0 Dredges, 0 XBTs

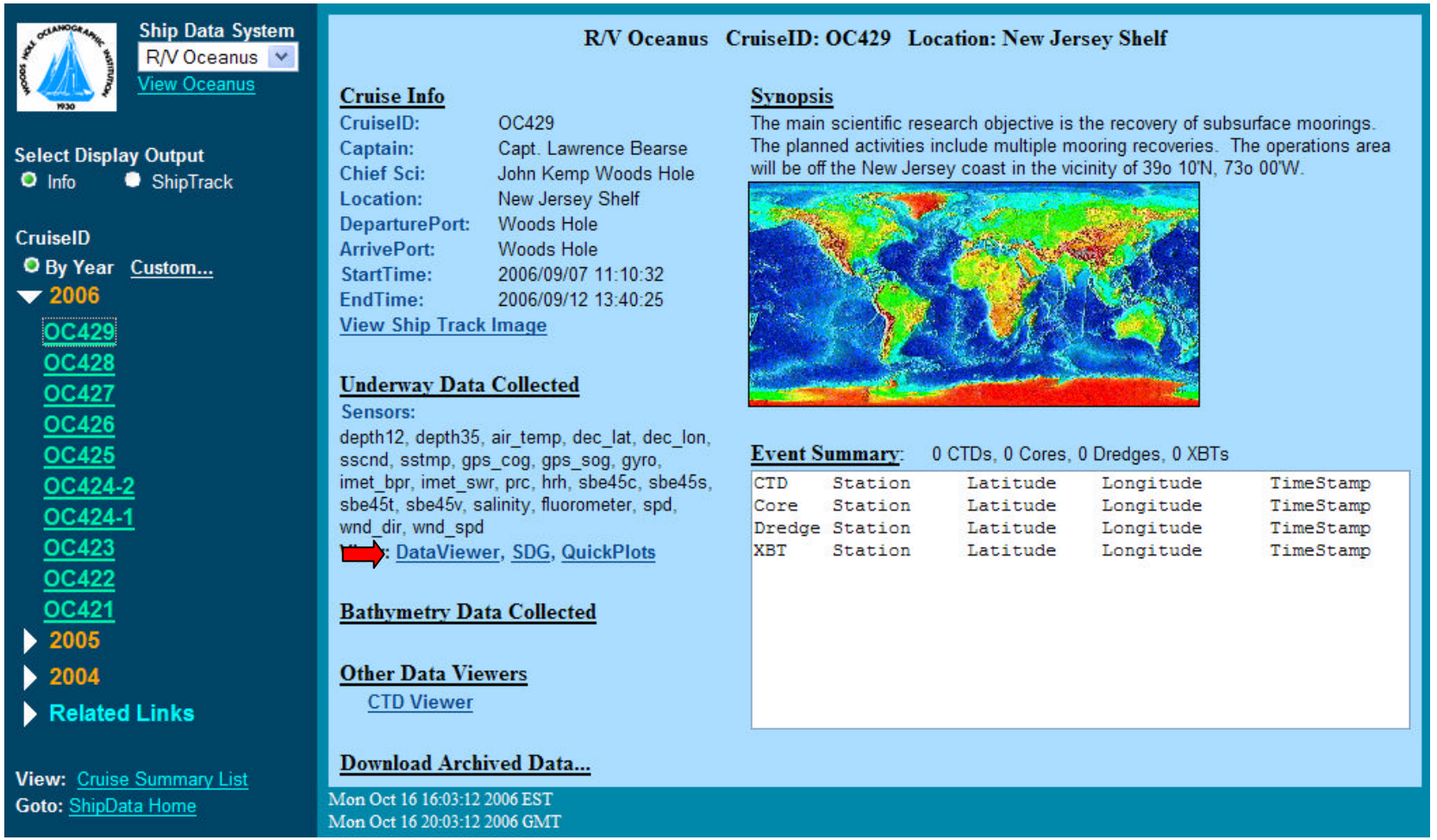
CTD	Station	Latitude	Longitude	TimeStamp
Core	Station	Latitude	Longitude	TimeStamp
Dredge	Station	Latitude	Longitude	TimeStamp
XBT	Station	Latitude	Longitude	TimeStamp

Mon Oct 16 16:03:12 2006 EST
Mon Oct 16 20:03:12 2006 GMT

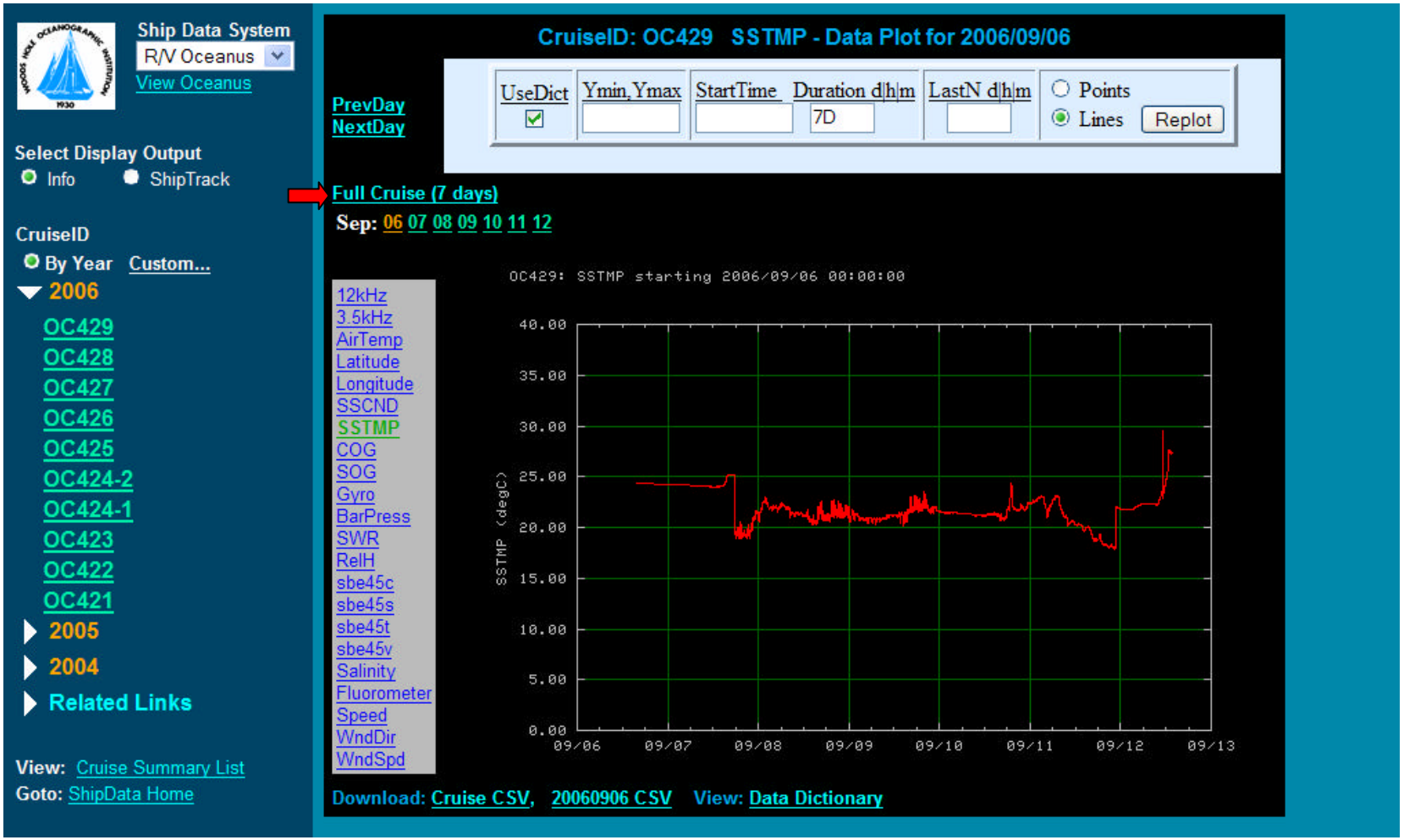
ShipData – Cruise Ship Track



ShipData – Cruise Info/DataViewer



ShipData – Interactive Data Viewer



ShipData – Cruise Info/SDG Viewer

Ship Data System
R/V Oceanus
View Oceanus

Select Display Output
Info ShipTrack

CruiseID
By Year Custom...
2006
OC429
OC428
OC427
OC426
OC425
OC424-2
OC424-1
OC423
OC422
OC421
2005
2004
Related Links

View: Cruise Summary List
Goto: ShipData Home

R/V Oceanus CruiseID: OC429 Location: New Jersey Shelf

Cruise Info

CruiseID:	OC429
Captain:	Capt. Lawrence Bearse
Chief Sci:	John Kemp Woods Hole
Location:	New Jersey Shelf
DeparturePort:	Woods Hole
ArrivePort:	Woods Hole
StartTime:	2006/09/07 11:10:32
EndTime:	2006/09/12 13:40:25

View Ship Track Image

Underway Data Collected

Sensors:
depth12, depth35, air_temp, dec_lat, dec_lon, sscnd, sstmp, gps_cog, gps_sog, gyro, imet_bpr, imet_swr, prc, hrh, sbe45c, sbe45s, sbe45t, sbe45v, salinity, fluorometer, spd, wnd_dir, wnd_spd

View: DataVie SDG, QuickPlots

Bathymetry Data Collected

Other Data Viewers

CTD Viewer

Download Archived Data...

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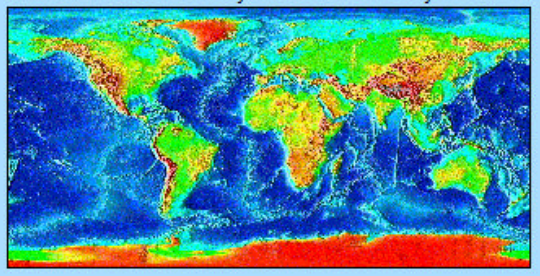
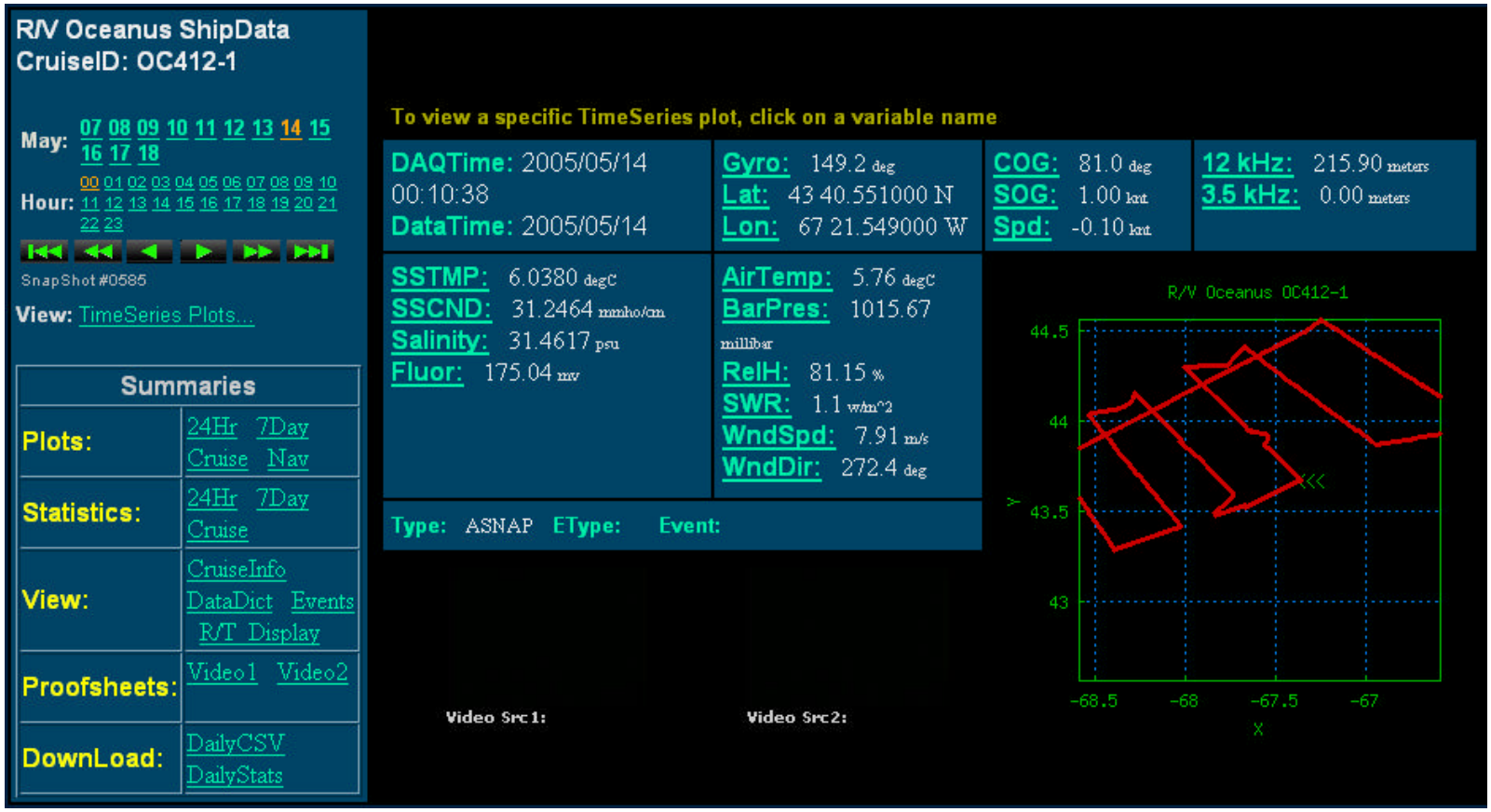


Event Summary: 0 CTDs, 0 Cores, 0 Dredges, 0 XBTs

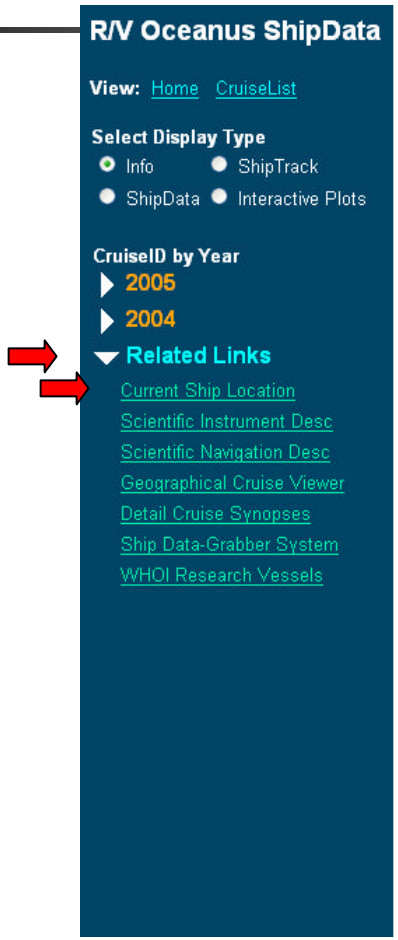
CTD	Station	Latitude	Longitude	TimeStamp
Core	Station	Latitude	Longitude	TimeStamp
Dredge	Station	Latitude	Longitude	TimeStamp
XBT	Station	Latitude	Longitude	TimeStamp

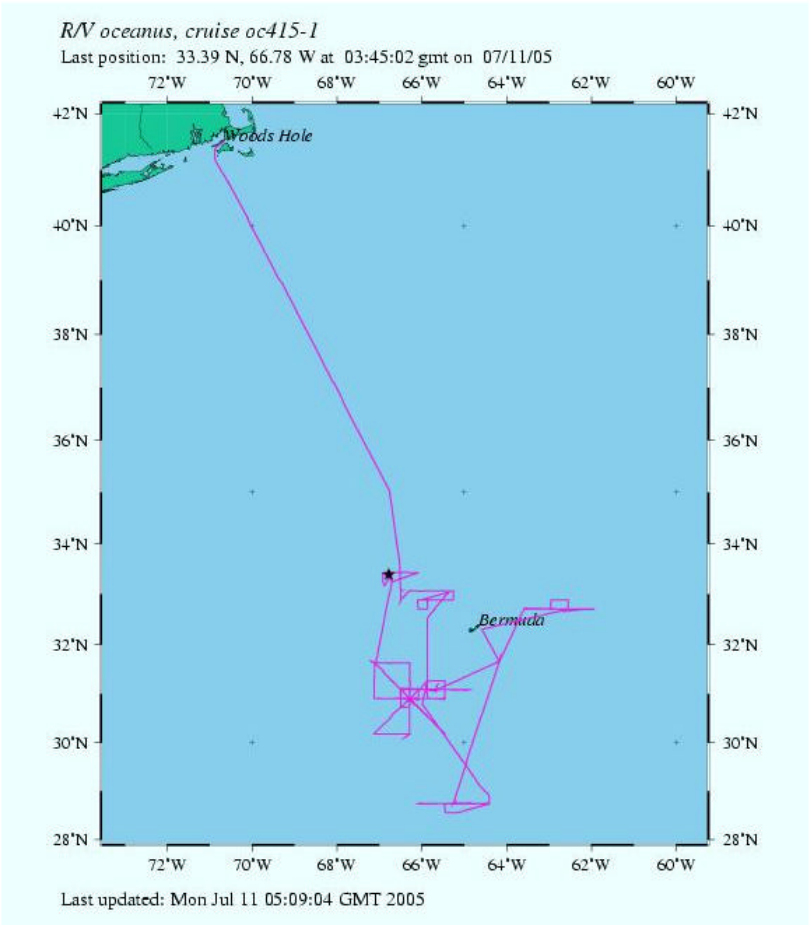
Mon Oct 16 16:03:12 2006 EST
Mon Oct 16 20:03:12 2006 GMT

Ship Data – Integrated Display

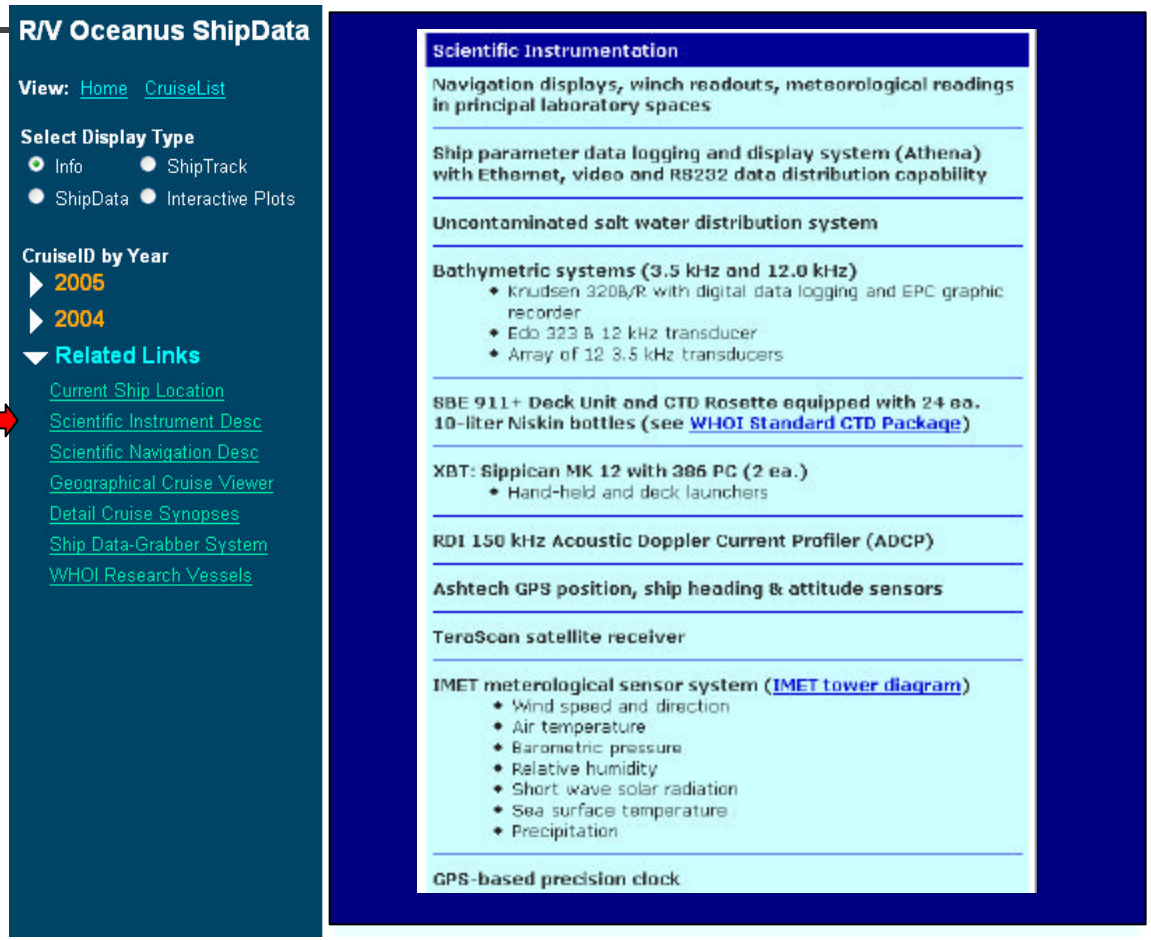


ShipData – Related Links

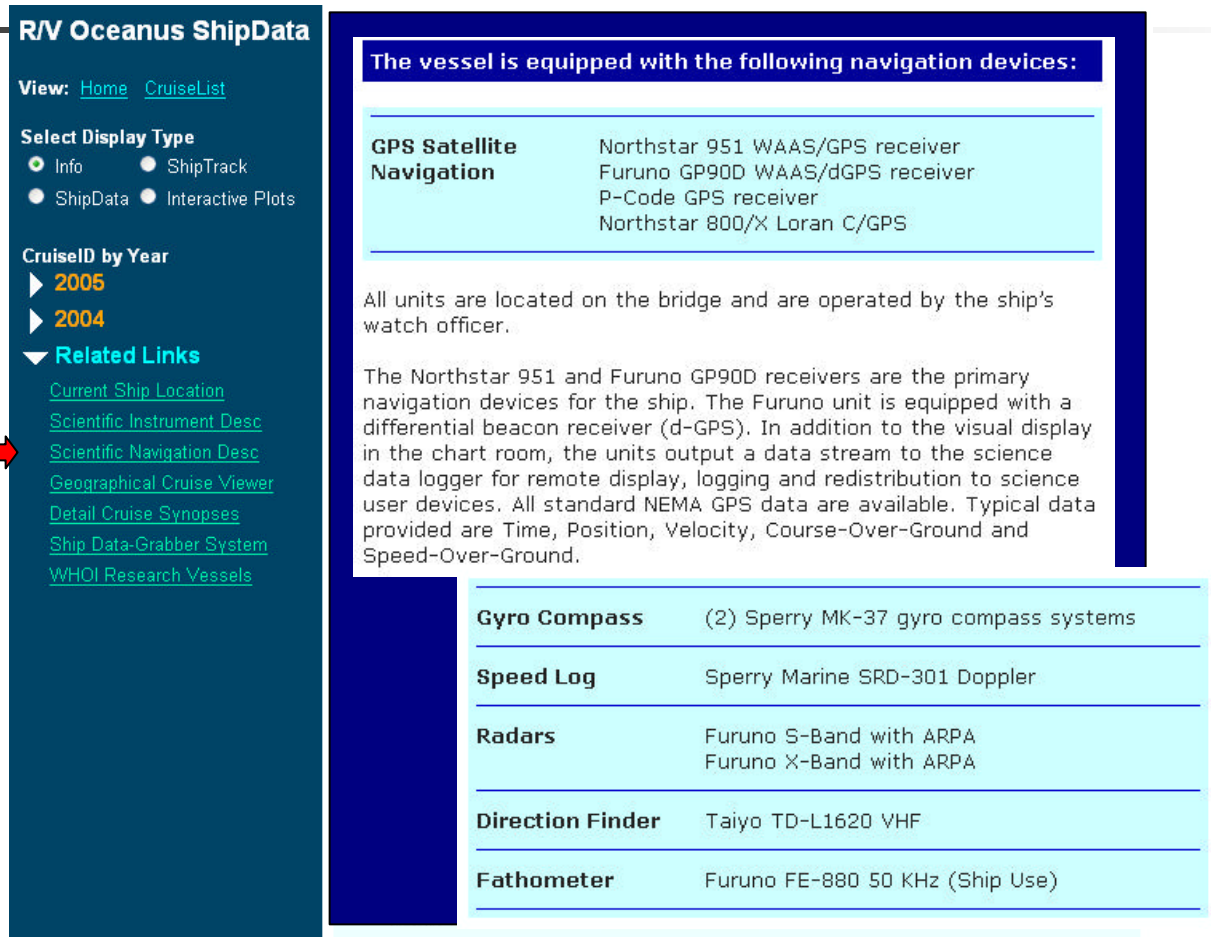




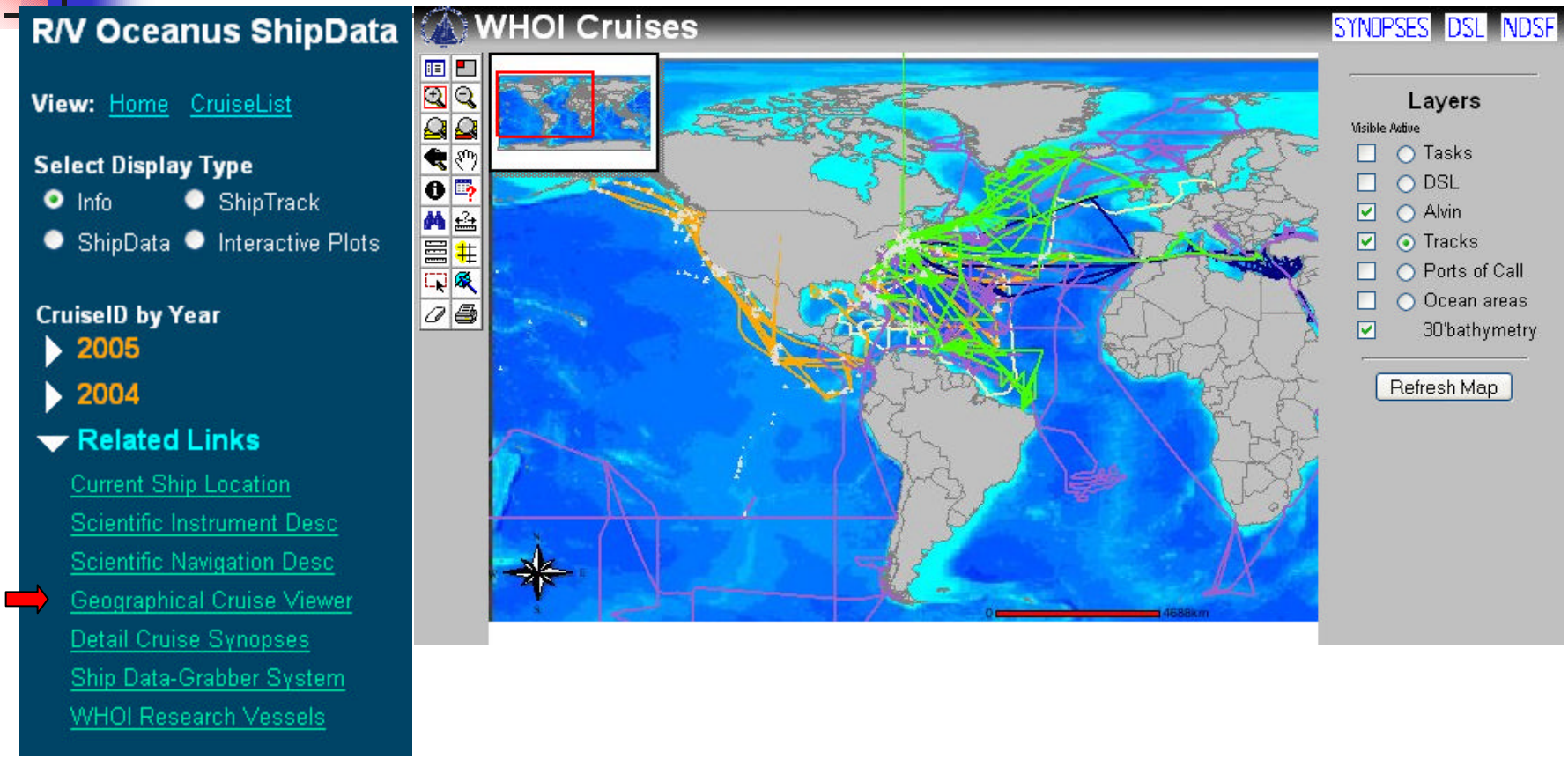
ShipData – Related Links



ShipData – Related Links



ShipData – Related Links



Ship Data-Grabber Summary


R/V Atlantis


R/V Knorr


R/V Oceanus


R/V Tioga

- Operational 2005-2006
  - Deployed on R/V Atlantis, Knorr, Oceanus, Tioga (50+ Cruises)
  - Integrated Ship Data, Instrument Data, and Map displaying current position. Video displays when available.
  - Web-based Interactive Data Plots for quick Q/A
  - On-Shore Web-Server Repository Setup
- Future
  - Provide links to complete on-line datasets
  - Incorporate real-time data from ships (similar to SW06 experiment)
  - Expand event logging system and ship operations for CTDs, Cores, Dredges
  - Develop automatic data catalog and meta-data summary reports