



RCRV Program: CORIOLIX Integrations

2020 RVTEC Meeting
Wednesday October 28th, 2020





RCRV – Datapresence & Engineering Support Center Staff



Katie Watkins-Brandt
Sensor Systems Engineer

Joined the project: 2011

Developed the underway sensor suite design, specification & procurement
Excels at instrument configuration, installation, maintenance, & procedures



Jasmine Nahorniak
Assistant Datapresence Systems Engineer

Joined the project: 2015

Lead CORIOLIX developer
Wide ranging skill set - from data management to UI design



Chris Romsos
Datapresence Systems Engineer

Joined the project: 2015

Lead for Datapresence and RCRV Cyberinfrastructure
Background – marine geology, fisheries, geographic info systems



Introduction

Cruise Observations Real-time Interface & Open Live Information eXchange

CORIOLIX *RV Endeavor - shore*

~ ATTENTION: YOU ARE VIEWING A DEMONSTRATION SITE FOR THE RCRV CORIOLIX SYSTEM ~
[more info](#)

Sensor Status

Ocean Sensors			
Fluorescence - SeaCAT	0.2 V	Sound Velocity - SeaCAT	81.0 m/s
Water Temperature - SeaCAT	20.1 °C	SST - SeaCAT	20.0 °C
Navigation Sensors			
Latitude	37.0228 °N	Longitude	-74.2588 °E
Vessel Heading - Gyro	202 ° from North	Water Depth - Echosounder	0.0 m
Meteorological Sensors			
Longwave Radiation	418.2 W/m2	Shortwave Radiation	-1.4 W/m2
True Wind Direction - max PS	68 °	True Wind Direction - NWS	59 °
Air Temperature - NWS	22.1 °C	Air Relative Humidity - Pilot House Roof	81 %RH
Air Pressure - Aft Main Lab	1017 hPa	Air Pressure - Bow	1016 hPa

Flowthrough System

Time Interval (minutes): 45

Current Time: Sun Oct 25 2020 23:26:21 UTC
Last Data Received: Sun Oct 25 2020 23:26:20 UTC
37.01829° N, -74.26107° E
Depth: 1762.8 m

Parameters (Y-axis):
 - Salinity (PSU): 33.44, 33.28, 33.12, 32.96, 32.8
 - Conductivity (S/m): 5200.8, 5192.2, 5184.4, 5176.6, 5168.8
 - Fluorescence (0-1): 4.65, 4.62, 4.59, 4.56, 4.53
 - Temperature (°C): 20.1, 20.25, 20.1, 20.1, 20.1

Legend:
 - THERMOSALINOGRAPH SALINITY (blue line)
 - SOUND VELOCITY (red line)
 - THERMOSALINOGRAPH CONDUCTIVITY (green line)
 - FLUORESCENCE (purple line)
 - SEA SURFACE TEMPERATURE (red line)
 - THERMOSALINOGRAPH TEMPERATURE (red line)
 - HULL THERMOMETER TEMPERATURE (red line)

For more information, please contact the R-DESC (RCRV Datapreence and Engineering Support Center). This project was funded by the National Science Foundation.

Logos: Oregon State University, RCRV Regional Class Research Vessels



Introduction

Cruise Observations Real-time Interface & Open Live Information eXchange

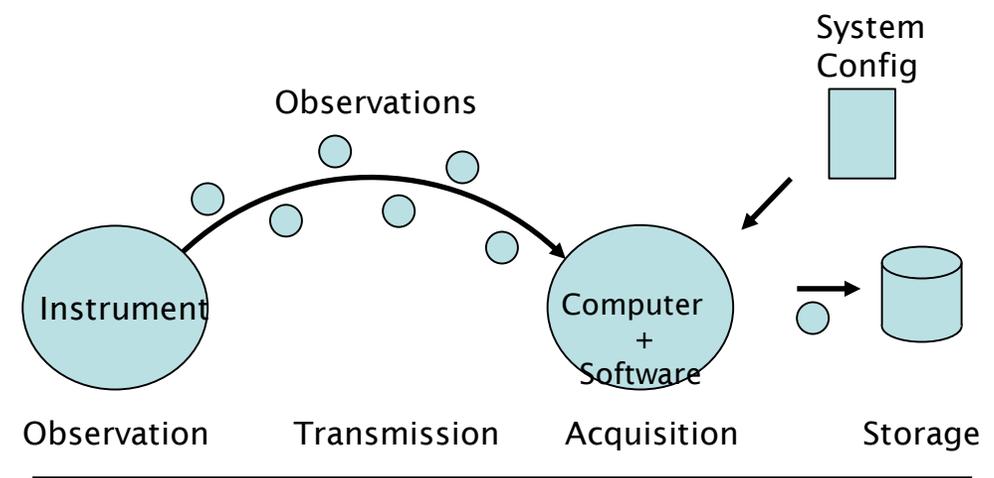
RVTEC 2019: Live CORIOLIX demo session(s) with Oceanus in transit from Hawaii

RVTEC 2020: Technical Topic, CORIOLIX Integrations

- ***Data Acquisition System Integration - OpenRVDAS***
- ***Data Service Integration – ERDDAP***



DAS Integration: OpenRVDAS <-> CORIOLIX



Data Acquisition

Provides Tools For:

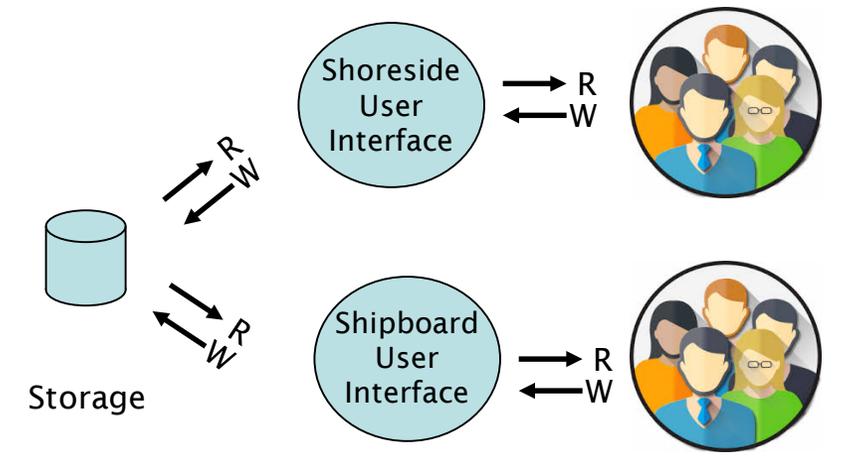
- Reading live data
- Parse/modify
- Writing to file/database

Reads from:

- Config Metadata
- Live data

Writes to:

- Timeseries data



Datapresence

Provides Tools For:

- Availability (ship/shore)
- Access (user groups)
- Monitoring system state
- Synchronizing metadata

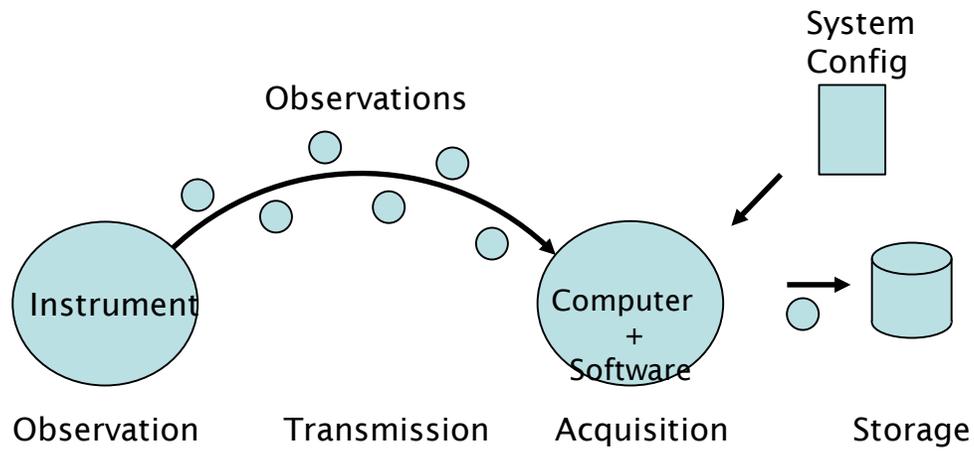
Reads from:

- Metadata
- Instrument datastore

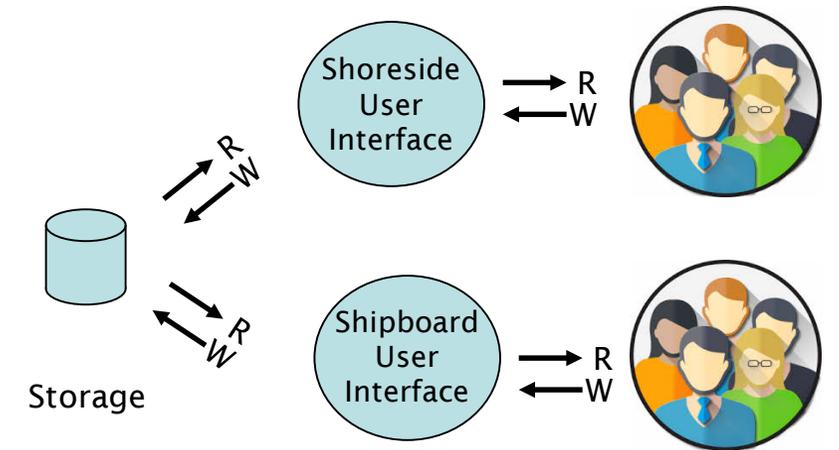
Writes to:

- Metadata
- Clients

DAS Integration: OpenRVDAS <-> CORIOLIX



OpenRVDAS



Replication Info. Mgmt. User Services

CORIOLIX

Primary Objective:

- Extend OpenRVDAS to write to CORIOLIX datastore

Secondary Objectives:

- Extend OpenRVDAS to derive system configuration from CORIOLIX metadata



DAS Integration: OpenRVDAS <-> CORIOLIX

RFP Fall 2019: RCRV Selected the team of Cohn and Pinner to complete the work.



David Pablo Cohn
OpenRVDAS Project Lead Developer and Project Owner



J. Webb Pinner
Owner & Principal at Capable Solutions





DAS Integration: Outcomes

Primary Outcome – **CORIOPIXWriter**

- OpenRVDAS writer plugin for writing incoming data streams to the appropriate CORIOPIX database table.
 - Extended OpenRVDAS to support logging to a **PostgreSQL** database
 - Extended OpenRVDAS to support parsing a data string and writing parts of the parsed data record to **multiple endpoints** (database tables)

Secondary Outcome – **Configure OpenRVDAS** by querying the CORIOPIX API for configuration metadata

- Developed a scripted workflow to construct an OpenRVDAS cruise configuration based on information extracted from the CORIOPIX API and information stored in a configuration template.





DAS Integration: Workflow

1. Configure OpenRVDAS script queries the CORIOLIX Sensor & Parameter tables for enabled sensors, connection, & parsing info:
<https://coriolix.ceoas.oregonstate.edu/oceanus/api/sensor/?enabled=true>
<https://coriolix.ceoas.oregonstate.edu/oceanus/api/parameter/>
2. API responds with a filtered list of enabled sensors and Parameter info as JSON

1

```
Django REST framework

Api Root

The default basic root view for DefaultRouter

GET /oceanus/api/

HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept

{
  "alert_config": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/alert_config/",
  "alert_action": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/alert_action/",
  "alert_current": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/alert_current/",
  "alert_archive": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/alert_archive/",
  "channel": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/channel/",
  "display": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/display/",
  "routes": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/routes/",
  "vessel": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/vessel/",
  "cruise": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/cruise/",
  "participants": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/participants/",
  "events": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/events/",
  "subevent": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/subevent/",
  "asset": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/asset/",
  "station": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/station/",
  "icon": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/icon/",
  "sensor": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/sensor/",
  "parameter": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/parameter/",
  "flagtypes": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/flagtypes/",
  "sensor_log": "https://coriolix.ceoas.oregonstate.edu/oceanus/api/sensor_log/",
```

```
[
  {
    "sensor_id": "gyro004",
    "sensor_name": "Gyrocompass",
    "sensor_ip": "172.20.90.51",
    "sensor_ethernet_protocol": "UDP",
    "sample_data_message": "",
    "text_regex_format": "\\{datetime:ti},$HEHDT,{heading:f},Tx{checksum:x}\\\"",
    "enabled": true,
    "vessel": "Simulated",
    "transmit_ip": "255.255.255.255",
    "transmit_port": 30051
  },
  {
    "sensor_id": "anemo005",
    "sensor_name": "Anemometer",
    "sensor_ip": "172.20.90.52",
    "sensor_ethernet_protocol": "UDP",
    "sample_data_message": "",
    "text_regex_format": "\\{datetime:ti},{direction:d},{speed:f},N,{speed_of_sound:f},{air_temp_degC:f}\\\"",
    "enabled": true,
    "vessel": "Simulated",
    "transmit_ip": "255.255.255.255",
    "transmit_port": 30052
  }
],
```

2

```
45     "sensor_id": "truewind003",
46     "flagtype_id": "range"},
47   {
48     "parameter_id": "652f00d2-5b46-4e22-8b9f-547d9ee569ef",
49     "short_name": "Heading",
50     "long_name": "Heading",
51     "description": "foo",
52     "samos_designator": "",
53     "samos_data_category": "",
54     "derived": false,
55     "data_regex_position": null,
56     "global_min": 0.0,
57     "global_max": 360.0,
58     "local_min": null,
59     "local_max": null,
60     "detection_limit": 0.0,
61     "saturated": 999999.9,
62     "bad_data_value": null,
63     "accuracy": null,
64     "precision": null,
65     "resolution": null,
66     "data_model": "SensorFloat9",
67     "data_table": "sensor_float_9",
68     "archive_data_table": "sensor_float_9_archive",
69     "data_fieldname": "p1",
70     "flag_fieldname": "f1",
71     "binned_default_model": "",
72     "binned_default_table": "",
73     "binned_default_fieldname": "",
74     "binned_custom_model": "",
75     "binned_custom_table": "",
76     "binned_custom_fieldname": "",
77     "ioos_category": "Location",
78     "standard_name": "platform_orientation",
79     "units": "degrees",
80     "units_abbrev": "degrees",
81     "data_type": "double",
82     "bin_type": "",
83     "display_format": ".7f",
84     "plot_color": "#000000",
85     "name": "truewind003",
86     "sensor_id": "gyro003",
87     "flagtype_id": "range"},
88   }
89 ],
90 {
91   "parameter_id": "a340dd1d-3eff-4aaf-87a7-b6f11bbfc3a1",
  "short_name": "Equil. Temperature",
```





DAS Integration: Workflow

3. Configure OpenRVDAS script reads the config_template.yaml (defines operational and logging modes)
4. Creates new cruise.yaml file by iterating over sensors list and using template to format the output file.

```

1 #####
2 # Cruise boilerplate
3 cruise:
4   id: RCRV-Sample
5   start: '2020-01-01'
6   end: '2020-12-31'
7
8 #####
9 # Logger definitions
10 loggers:
11   default: # Default set of configurations for a sensor
12     configs:
13       - 'off' # 'off' is a yaml keyword, so needs to be quoted
14       - stderr # echo raw input to stderr
15       - udp # parse and rebroadcast to UDP
16       - file/udp # store raw to logfile, parse and rebroadcast to UDP
17       - file/udp/db # store raw to logfile, parse and store to db
18
19 #gyro004: # example of a non-default set of configs for a sensor
20 # configs:
21 # - 'off'
22 # - udp
23 # - file/udp/db
24
25 #####
26 # Unique collections of logger configurations comprise Modes
27 modes:
28   'off':
29     default: 'off'
30
31 monitor:
32   default: udp
33 #gyro004: 'off' # example of non-default config for mode
34
35 underway:
36   default: file/udp/db
37
38 #####
39 default_mode: 'off'
40
41 #####
42 config_globals:
43   _UDP_WRITE_PORT_: 6221
44   _FILE_BASE_: /var/tmp/log/openrvdas
45
46 #####
47

```

```

11 - class: ComposedWriter
12   kwargs:
13     transforms:
14       - class: PrefixTransform
15     kwargs:
16       prefix: _SENSOR_ID_
17 - class: ParseTransform
18   kwargs:
19     record_format: '{data_id:w} {timestamp:ti},{field_string:os}'
20     field_patterns: _FIELD_PATTERNS_
21
22 writers:
23   - class: UDPWriter
24     kwargs:
25       port: _UDP_WRITE_PORT_
26
27 # Template to store raw to logfile, parse and rebroadcast to UDP
28 # and store to CORIOLIX database
29
30 file/udp/db:
31   name: _SENSOR_ID_>file/udp/db
32   readers:
33     - class: UDPReader
34     kwargs:
35       port: _UDP_PORT_
36   writers:
37     - class: LogfileWriter
38     kwargs:
39       filebase: _FILE_BASE_/_SENSOR_ID_/raw/_SENSOR_ID_
40       split_char: ','
41   - class: ComposedWriter
42     kwargs:
43       transforms:
44         - class: PrefixTransform
45       kwargs:
46         prefix: _SENSOR_ID_
47     - class: ParseTransform
48     kwargs:
49       record_format: '{data_id:w} {timestamp:ti},{field_string:os}'
50       field_patterns: _FIELD_PATTERNS_
51
52 writers:
53   - class: UDPWriter
54     kwargs:
55       port: _UDP_WRITE_PORT_
56   - class: CORIOLIXWriter
57     module: local.rcrv.modules.coriolix_writer
58     kwargs:
59       data_table: _DATA_TABLE_
60

```

```

5 loggers:
6   gyro004:
7     configs:
8       - gyro004->off
9       - gyro004->stderr
10      - gyro004->udp
11      - gyro004->file/udp
12      - gyro004->file/udp/db
13
14 anemo005:
15   echowell003:
16   gnss004:
17   thermo005:
18   tsg004:
19   radiom005:
20   metstn004:
21   transmiss004:
22
23 modes:
24   'off':
25     gyro004: gyro004->off
26     anemo005: anemo005->off
27     echowell003: echowell003->off
28     gnss004: gnss004->off
29     thermo005: thermo005->off
30     tsg004: tsg004->off
31     radiom005: radiom005->off
32     metstn004: metstn004->off
33     transmiss004: transmiss004->off
34
35 monitor:
36   underway:
37     gyro004: gyro004->file/udp/db
38     anemo005: anemo005->file/udp/db
39     echowell003: echowell003->file/udp/db
40     gnss004: gnss004->file/udp/db
41     thermo005: thermo005->file/udp/db
42     tsg004: tsg004->file/udp/db
43     radiom005: radiom005->file/udp/db
44     metstn004: metstn004->file/udp/db
45     transmiss004: transmiss004->file/udp/db
46
47 default_mode: 'off'
48
49 configs:
50   gyro004->off:

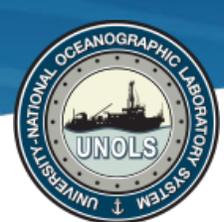
```

```

94 gnss004: gnss004->file/udp/db
95 thermo005: thermo005->file/udp/db
96 tsg004: tsg004->file/udp/db
97 radiom005: radiom005->file/udp/db
98 metstn004: metstn004->file/udp/db
99 transmiss004: transmiss004->file/udp/db
100
101 default_mode: 'off'
102
103 configs:
104   gyro004->off:
105   gyro004->stderr:
106   gyro004->udp:
107   gyro004->file/udp:
108   gyro004->file/udp/db:
109     name: gyro004->file/udp/db
110     readers:
111       - class: UDPReader
112       kwargs:
113         port: 30357
114     writers:
115       - class: LogfileWriter
116     kwargs:
117       filebase: /var/tmp/log/openrvdas/gyro004/raw/gyro004
118       split_char: ','
119     - class: ComposedWriter
120     kwargs:
121       transforms:
122         - class: PrefixTransform
123       kwargs:
124         prefix: gyro004
125     - class: ParseTransform
126     kwargs:
127       record_format: '{data_id:w} {timestamp:ti},{field_string:os}'
128       field_patterns:
129         - $HEHDT,{heading:f},T*{checksum:x}
130     writers:
131       - class: UDPWriter
132     kwargs:
133       port: 6221
134     - class: CORIOLIXWriter
135     module: local.rcrv.modules.coriolix_writer
136     kwargs:
137       data_table:
138         gyro_brdg_archive:
139           - heading
140
141 anemo005->off:
142   name: anemo005->off
143   kwargs:
144     anemo005->stderr:

```





DAS Integration: OpenRVDAS <-> CORIOLIX

172.20.230.230:8000

RCRV-Sample Cruise Management

Mode: Now: Sun Oct 25 2020 16:46:02

Server: Sun Oct 25 2020 16:46:02

Status: Sun Oct 25 2020 16:46:02

logger	configuration	
gyro004	<input type="button" value="gyro004->off"/>	2020-10-25T23:45:29.174960Z INFO Start config gyro004->off
anemo005	<input type="button" value="anemo005->off"/>	2020-10-25T23:45:29.174811Z INFO Start config anemo005->off
echowell003	<input type="button" value="echowell003->off"/>	2020-10-25T23:45:29.174355Z INFO Start config echowell003->off
gnss004	<input type="button" value="gnss004->off"/>	2020-10-25T23:45:29.173807Z INFO Start config gnss004->off
thermo005	<input type="button" value="thermo005->off"/>	2020-10-25T23:45:29.174200Z INFO Start config thermo005->off
tsg004	<input type="button" value="tsg004->off"/>	2020-10-25T23:45:29.174656Z INFO Start config tsg004->off
radiom005	<input type="button" value="radiom005->off"/>	2020-10-25T23:45:29.174027Z INFO Start config radiom005->off
metstn004	<input type="button" value="metstn004->off"/>	2020-10-25T23:45:29.174506Z INFO Start config metstn004->off
transmiss004	<input type="button" value="transmiss004->off"/>	2020-10-25T23:45:29.175106Z INFO Start config transmiss004->off

Current definition file: `/opt/openrvdas/local/rcrv/cruise.yaml`

Logged in as **rvdas**. [Log out](#)

172.20.230.230:8000

RCRV-Sample Cruise Management

Mode: Now: Sun Oct 25 2020 16:49:12

Server: Sun Oct 25 2020 16:49:12

Status: Sun Oct 25 2020 16:49:12

logger	configuration	
gyro004	<input type="button" value="gyro004->file/udp/db"/>	2020-10-25T23:46:20.925731Z INFO Stopping config gyro004->file/udp/db 2020-10-25T23:46:21.002943Z INFO Start config gyro004->file/udp/db
anemo005	<input type="button" value="anemo005->file/udp/db"/>	2020-10-25T23:46:20.926037Z INFO Stopping config anemo005->file/udp/db 2020-10-25T23:46:21.003275Z INFO Start config anemo005->file/udp/db
echowell003	<input type="button" value="echowell003->file/udp/db"/>	2020-10-25T23:46:20.925885Z INFO Stopping config echowell003->file/udp/db 2020-10-25T23:46:21.003579Z INFO Start config echowell003->file/udp/db
gnss004	<input type="button" value="gnss004->file/udp/db"/>	2020-10-25T23:46:20.925358Z INFO Stopping config gnss004->file/udp/db 2020-10-25T23:46:21.003729Z INFO Start config gnss004->file/udp/db
thermo005	<input type="button" value="thermo005->file/udp/db"/>	2020-10-25T23:46:20.926508Z INFO Stopping config thermo005->file/udp/db 2020-10-25T23:46:21.003099Z INFO Start config thermo005->file/udp/db
tsg004	<input type="button" value="tsg004->file/udp/db"/>	2020-10-25T23:46:20.926655Z INFO Stopping config tsg004->file/udp/db 2020-10-25T23:46:21.003427Z INFO Start config tsg004->file/udp/db
radiom005	<input type="button" value="radiom005->file/udp/db"/>	2020-10-25T23:46:20.926206Z INFO Stopping config radiom005->file/udp/db 2020-10-25T23:46:21.002778Z INFO Start config radiom005->file/udp/db
metstn004	<input type="button" value="metstn004->file/udp/db"/>	2020-10-25T23:46:20.925570Z INFO Stopping config metstn004->file/udp/db 2020-10-25T23:46:21.003877Z INFO Start config metstn004->file/udp/db
transmiss004	<input type="button" value="transmiss004->file/udp/db"/>	2020-10-25T23:46:20.926360Z INFO Stopping config transmiss004->file/udp/db 2020-10-25T23:46:21.002524Z INFO Start config transmiss004->file/udp/db

Current definition file: `/opt/openrvdas/local/rcrv/cruise.yaml`

Logged in as **rvdas**. [Log out](#)

OpenRVDAS Cruise Management - Mozilla Firefox

172.20.230.230:8000/edit_config/radiom005

Select config: radiom005->file/udp/db [mode default]

radiom005->off

radiom005->stderr

radiom005->udp

radiom005->file/udp

radiom005->file/udp/db [mode default]

```

{
  name: "radiom005",
  readers: [
    { 2 items },
  ],
  writers: [
    { 2 items },
    { 2 items }
  ]
}

```

OpenRVDAS (c)2018 David Pablo Cohn





Data Service Integration: CORIOLIX <-> ERDDAP



ERDDAP

Easier access to scientific data

[log in](#)

Brought to you by [NOAA NMFS SWFSC ERD](#)

Previous integration example – **Data Acquisition** and managing **Data Acquisition** configuration

This example – **Data Services**, specifically **Scientific Data Services**

Data Services – software to make data more accessible and useable

Scientific Data Services – software to makes data more accessible and usable to scientific clients

What can you do with a data server like ERDDAP?

- Provide **Query & Subset** functionality on top of read access
- Support a range of scientific output **format translations** (.asc, .csv, OPeNDAP, geoJSON, .mat, .nc, .kml, etc)
- Publish and **Subscribe** options (subscribe to remote sensing data and server locally)





Data Service Integration: CORIOLIX <-> ERDDAP

ERDDAP
Easier access to scientific data
Brought to you by NOAA NMFS SWFSC ERD

ERDDAP > tabledap > Data Access Form

Dataset Title: **RV Oceanus : ANEMO_MMAST_ARCHIVE** [✉](#) [RSS](#)
 Institution: Oregon State University (Dataset ID: anemo_mmast_archive)
 Information: [Summary](#) | [License](#) | [Metadata](#) | [Background](#) | [Make a graph](#)

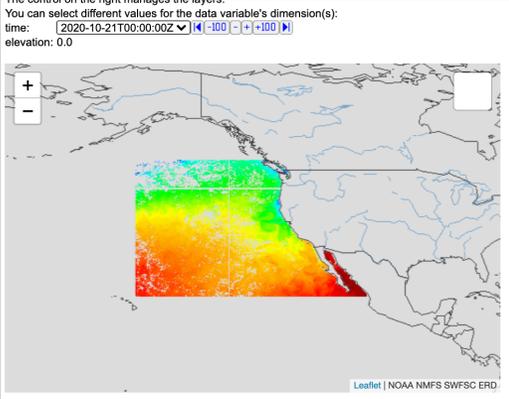
Variable: Check All | Uncheck All

Optional Constraint #1: >> 2020-10-01T12:00:00 <<< 2020-10-25T12:00:00
 Optional Constraint #2: <<< >>>
 Minimum: Maximum

datetime (UTC)
 datetime_corrected (UTC)
 direction (wind_to_direction, degrees)
 direction_flags (none)
 speed (nautical miles per hour)
 speed_flags (wind_speed_status_flag, none)

Server-side Functions
 distinct()
 orderByMax: speed
 File type: [\(more info\)](#)
 .nc - Download a flat, table-like, NetCDF-3 binary file with COARDS/CF/ACDD metadata.
 Just generate the URL: https://coriolix.ceoas.oregonstate.edu/oceanus_erdap/erddap/t/
[\(Documentation / Bypass this form\)](#)

Submit (Please be patient. It may take a while to get the data.)



ERDDAP
Easier access to scientific data
Brought to you by NOAA NMFS SWFSC ERD

ERDDAP > List of All Datasets

30 matching datasets, listed in alphabetical order.

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	W M S	Source Data Files	Title	Summary	FGDC, ISO, Metadata	Background Info	RSS	E mail	Institution	Dataset ID
	set	data	graph			* The List of All Active Datasets in this ERDDAP *	?	M	background			Oregon State Univ...	allDatasets
data			graph	M		Chlorophyll-a, Aqua MODIS, NPP, 0.0125°, West US, EXPERIMENTAL, 2002-present (8 Day Composite), Lon+/-180	?	F I M	background	RSS	✉	NOAA NMFS SWFSC ERD	MODIS_Ch1_8day
data			graph	M		Fluorescence, Aqua MODIS, NPP, 0.0125°, West US, 2002-present (8 Day Composite), Lon+/-180	?	F I M	background	RSS	✉	NOAA NMFS SWFSC ERD	MODIS_Ch1_Fluorescence_8day
		data	graph			RV Oceanus : ANEMO_MMAST_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	anemo_mmast_archive
		data	graph			RV Oceanus : BINNED_CUSTOM_FLOW_ROLLING	?	F I M	background	RSS	✉	Oregon State Univ...	binned_custom_flow_rolling
		data	graph			RV Oceanus : BINNED_CUSTOM_MET_ROLLING	?	F I M	background	RSS	✉	Oregon State Univ...	binned_custom_met_rolling
		data	graph			RV Oceanus : BINNED_CUSTOM_NAV_ROLLING	?	F I M	background	RSS	✉	Oregon State Univ...	binned_custom_nav_rolling
		data	graph			RV Oceanus : BINNED_DEFAULT_FLOW_ROLLING	?	F I M	background	RSS	✉	Oregon State Univ...	binned_default_flow_rolling
		data	graph			RV Oceanus : BINNED_DEFAULT_MET_ROLLING	?	F I M	background	RSS	✉	Oregon State Univ...	binned_default_met_rolling
		data	graph			RV Oceanus : BINNED_DEFAULT_NAV_ROLLING	?	F I M	background	RSS	✉	Oregon State Univ...	binned_default_nav_rolling
		data	graph			RV Oceanus : CUR_OBS	?	M	background	RSS	✉	Oregon State Univ...	cur_obs
		data	graph			RV Oceanus : ECHO_WELL_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	echo_well_archive
		data	graph			RV Oceanus : FLUOR_FLTH_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	fluor_flth_archive
		data	graph			RV Oceanus : GNSS_GGA_BOW_ARCHIVE	?	F I M	background	RSS	✉	Oregon State Univ...	gnss_gga_bow_archive
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		data	graph			RV Oceanus : METSTN_STBD_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	metstn_stbd_archive
		data	graph			RV Oceanus : PAR_MMAST_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	par_mmast_archive
		data	graph			RV Oceanus : RAD_MMAST_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	rad_mmast_archive
		data	graph			RV Oceanus : RAIN_MMAST_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	rain_mmast_archive
		data	graph			RV Oceanus : SENSOR_FLOAT_1_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	sensor_float_1_archive
		data	graph			RV Oceanus : SENSOR_FLOAT_2_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	sensor_float_2_archive
		data	graph			RV Oceanus : SPEEDLOG_WELL_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	speedlog_well_archive
		data	graph			RV Oceanus : THERM_FWD_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	therm_fwd_archive
		data	graph			RV Oceanus : THERM_HULL_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	therm_hull_archive
		data	graph			RV Oceanus : TRANSMISS_FLTH_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	transmiss_flth_archive
		data	graph			RV Oceanus : TRUE_WINDS_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	true_winds_archive
		data	graph			RV Oceanus : TSG_FLTH_ARCHIVE	?	M	background	RSS	✉	Oregon State Univ...	tsg_flth_archive
data			graph	M		SST, Aqua MODIS, NPP, 0.0125°, West US, Day time (11 microns), 2002-present (8 Day Composite), Lon+/-180	?	F I M	background	RSS	✉	NOAA NMFS SWFSC ERD	MODIS_SST_Daytime_8day





Data Service Integration: CORIOLIX <-> ERDDAP

ERDDAP
Easier access to scientific data
Brought to you by NOAA NMFS SWFSC ERD

ERDDAP > wms > MODIS_SST_Daytime_8day

SST, Aqua MODIS, NPP, 0.0125°, West US, Day time (11 microns), 2002-present (8 Day Composite), Lon+/-180 [RSS](#)

Dataset Title: SST, Aqua MODIS, NPP, 0.0125°, West US, Day time (11 microns), 2002-present (8 Day Composite), Lon+/-180

Institution: NOAA NMFS SWFSC ERD (Dataset ID: MODIS_SST_Daytime_8day)

Information: [Summary](#) | [License](#) | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Data Access Form](#) | [Make a graph](#)

This web page is using [Leaflet](#) to display maps which are created on-the-fly by ERDDAP's Web Map Server (WMS) version 1.3.0.

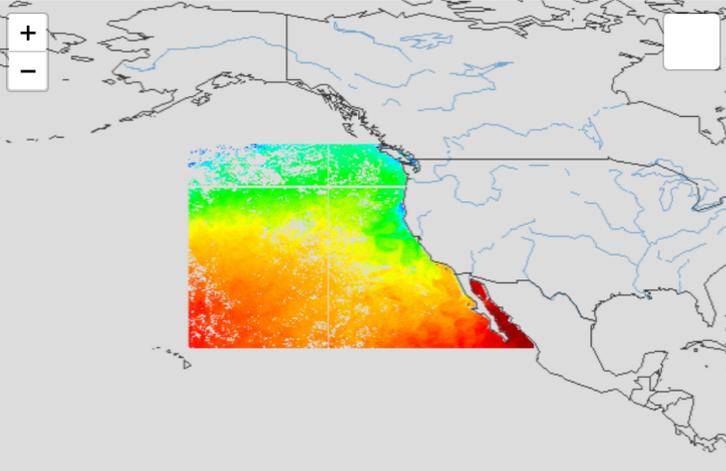
The control on the left of the map lets you zoom in (+) or out (-).

The control on the right manages the layers.

You can select different values for the data variable's dimension(s):

time:

elevation: 0.0



Leaflet | NOAA NMFS SWFSC ERD

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Very simple to add

- Reload: 1/day
- Keep: 1 month
- Link: to remote data



Data Service Integration: CORIOLIX <-> ERDDAP

Cruise Charts Sensor Plots Status Sensors Data Documents Cruises My Account About

CORIOLIX *RV Endeavor - shore*

Current Time: Mon Oct 26 2020 23:07:29 UTC
Last Data Received: Mon Oct 26 2020 23:07:28 UTC
33.62181° N, -75.71003° E
Depth 3004.3 m

ATTENTION: YOU ARE VIEWING A DEMONSTRATION SITE FOR THE RCRV CORIOLIX SYSTEM - more info

Cruise Chart

Layer Control

- NOAA RNCs
- Global Multi-Res BathyTopo
- Ship Route Data**
 - Ship Track
 - TSG Temperature (C)
 - Salinity (PSU)
 - Chl-a Fluorescence (V)
 - PSP (Wm⁻²)
- NOAA OCS Wrecks & Obstructions Database**
 - awios_wrecks
 - awios_obstructions
 - enc_wrecks
- Weather Overlays**
 - NowCOAST
- Vector Overlays**
 - OOI Pioneer Array Assets
- Raster Overlays**
 - Latest 8-Day SST
 - Latest 8-Day Chl-a
- Points**
 - Live Added Points
 - Archived Points

Sea Surface Temperature (degree_C)
SST, Aqua MODIS, NPP: 0.0125°, West US, Day time (11 microns), 2002-present, 8 Day Compositel, Lon=-180 (2020-10-21T00:00:00Z, Altitude=0.0 m)
Data courtesy of NOAA NMFS SWFSC ERD

Mouse Pointer:
Lat: 39.7911
Lng: -108.7537

Cruise Charts Sensor Plots Status Sensors Data Documents Cruises My Account About

Data Download

More download options are available from the [Binned Data Download](#) and [Full Resolution Download](#) pages.

One-Click

[Download EN658 Thermosalinograph - SeaCAT Data](#)

Cruise: EN658
Start Date: Oct. 22, 2020
End Date: Nov. 9, 2020
Chief Scientist: Young, Craig

Download the entire CORIOLIX full resolution dataset for the latest cruise.

Customized

[Download Customized Thermosalinograph - SeaCAT Data](#)

Customize your dataset using the options below.

Temporal Resolution:

Date Range:

Data Format:

Show Data Access URLs

Data URLs

[https://coriolix.ceos.oregonstate.edu/endeavor_erdap/erdap/tabledap/sensor_float_5_archive.csv?datetime,dateime_corrected,p1,f1&datetime=>2020-10-26T00:00:00&datetime=<2020-10-26T23:59:59&orderBy\('datetime'\)](https://coriolix.ceos.oregonstate.edu/endeavor_erdap/erdap/tabledap/sensor_float_5_archive.csv?datetime,dateime_corrected,p1,f1&datetime=>2020-10-26T00:00:00&datetime=<2020-10-26T23:59:59&orderBy('datetime'))
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Metadata URLs

https://coriolix.ceos.oregonstate.edu/endeavor_erdap/erdap/info/sensor_float_5_archive/index.html
https://coriolix.ceos.oregonstate.edu/endeavor_erdap/erdap/info/sensor_float_5_archive/index.html
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Flowthrough

<input checked="" type="checkbox"/>	Select/Deselect All	
<input checked="" type="checkbox"/>	Conductivity (S m-1)	Thermosalinograph - SeaCAT
<input checked="" type="checkbox"/>	Fluorescence (V)	Thermosalinograph - SeaCAT
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<input checked="" type="checkbox"/>	Sound Velocity (m s-1)	Thermosalinograph - SeaCAT
<input checked="" type="checkbox"/>	Temperature (degrees_C)	Thermosalinograph - SeaCAT
<input checked="" type="checkbox"/>	Temperature (degrees_C)	Thermosalinograph - SeaCAT

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