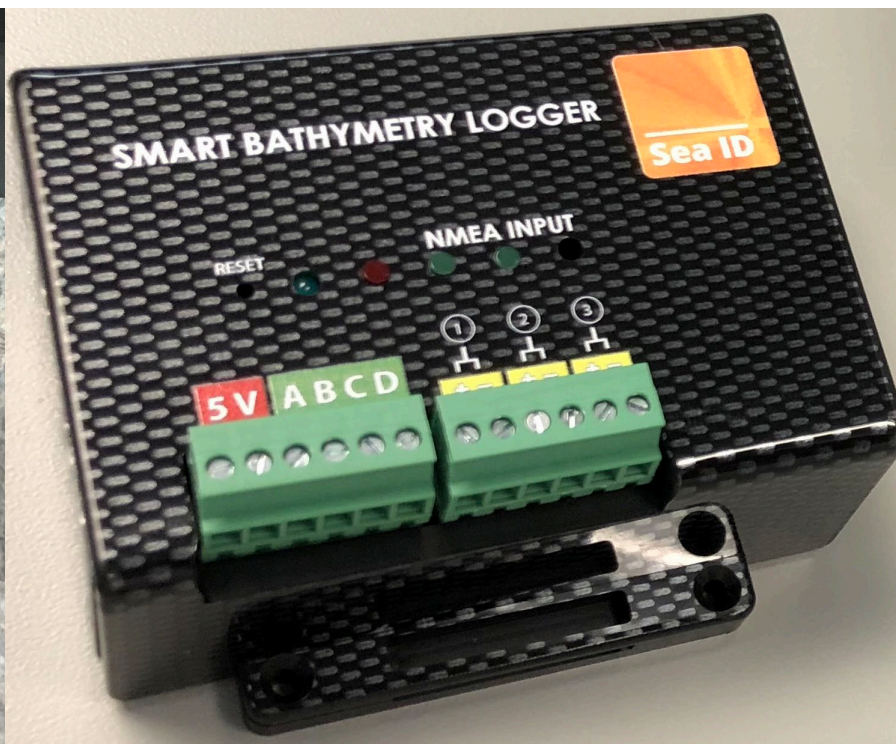
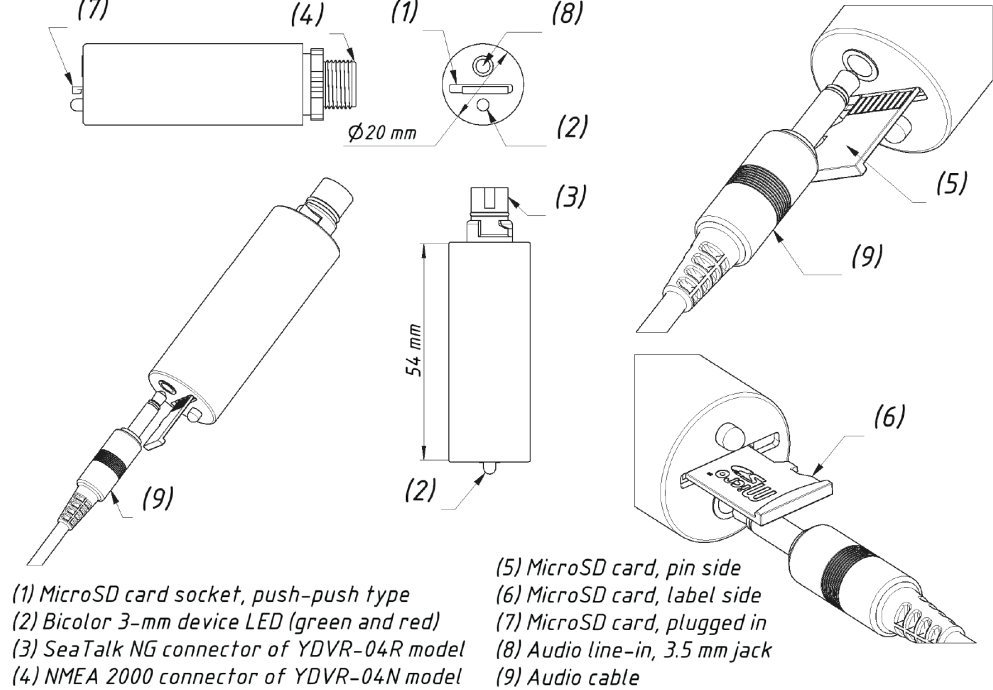


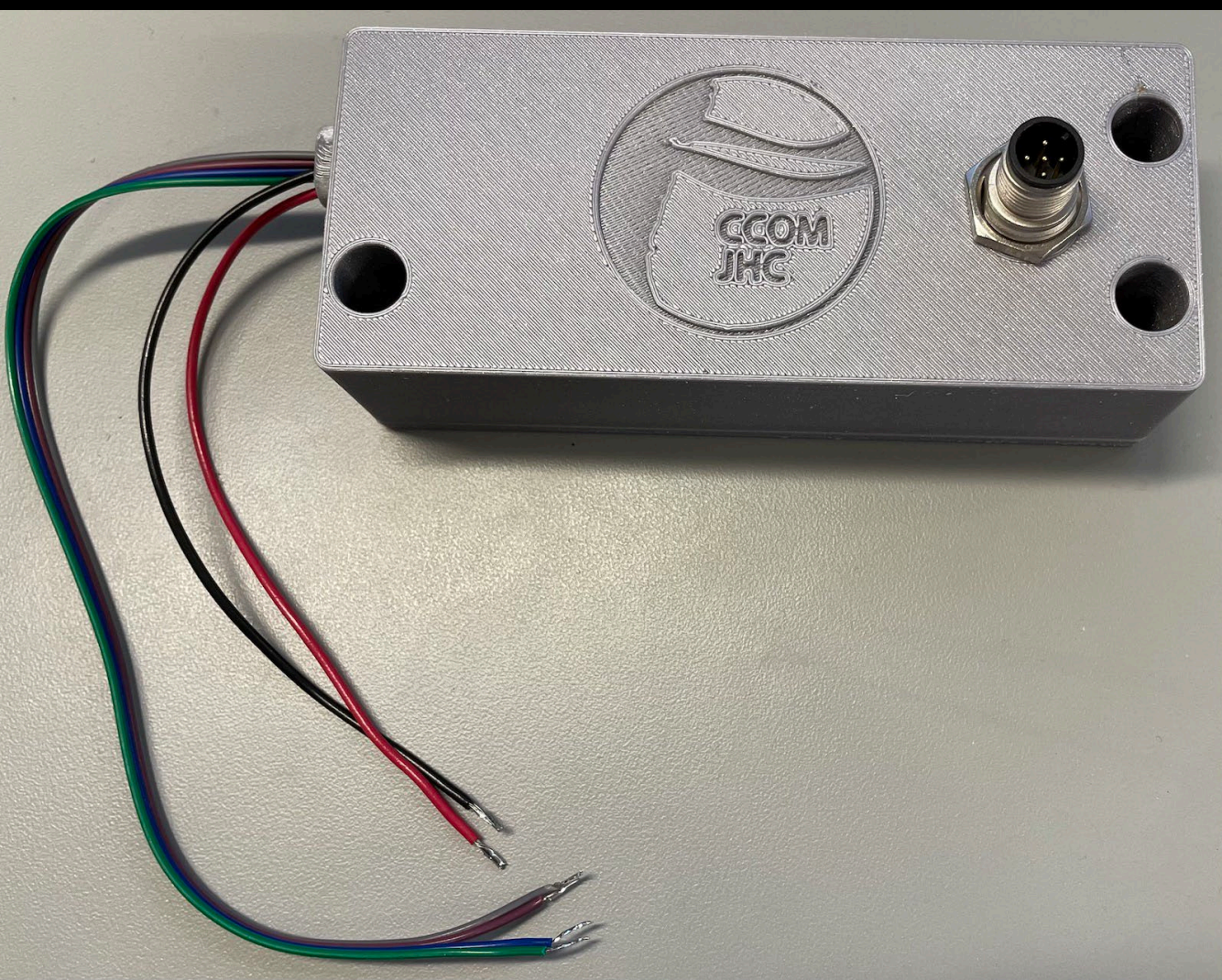
A scenic view of a harbor with a long pier, several boats, and a clear blue sky. The pier extends from the left side of the frame towards the center, with a small white building on its left end. Several boats are docked along the pier, and a larger boat with a yellow crane is visible on the right. The water is a deep blue, and the sky is a clear, bright blue with a few wispy clouds.

(A System to Support) Cloud-based Volunteer Bathymetric Data Processing

Brian R. Calder (brc@ccom.unh.edu) & Brian Miles (bmiles@ccom.unh.edu)
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Chase Ocean Engineering Lab, 24 Colovos Road, Durham NH 03824

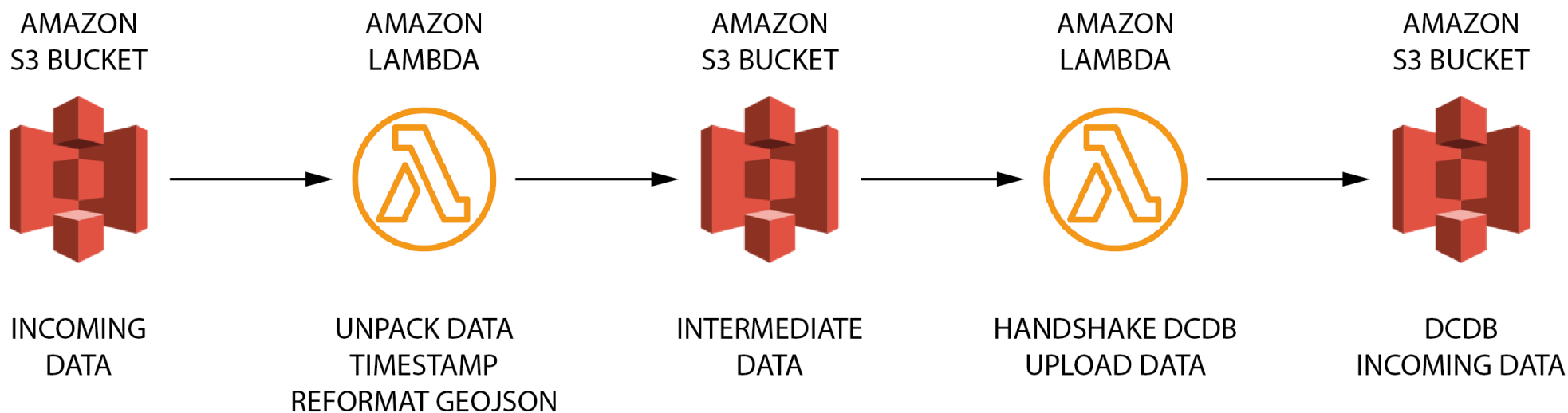


What's the
minimum-cost,
minimal-functionality,
data collection **SYSTEM** for VBI?





<https://bitbucket.org/ccomjhc/wibl/src/master/>

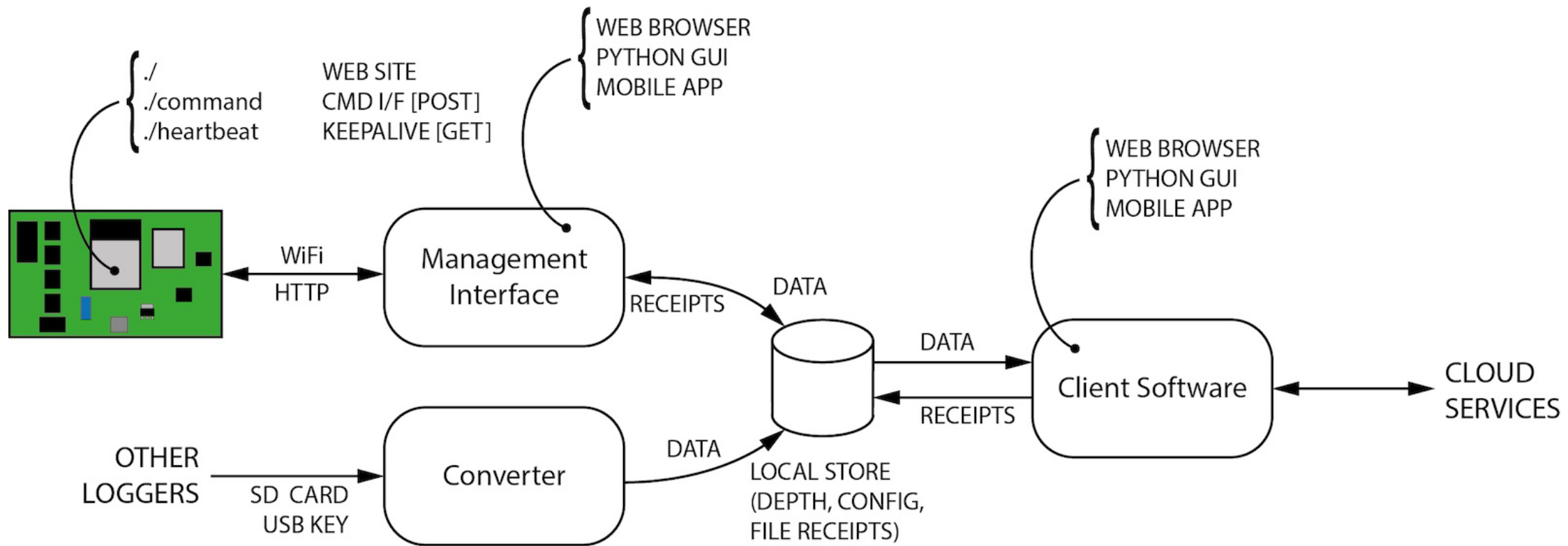


~~Bluetooth~~

~~Deployment~~

~~Flexibility~~

~~Visibility~~



DESKTOPUI

- __pycache__
- assets
 - default_config.json
- algorithms.py
- command.py
- configure.py
- filters.py
- main.py
- transfer.py

```

183
184
185
186
187
188
189
190
191
192
193
194
195
  
```

WIBL Data Management Interface 1.0.0

Versions

- Command Processor 1.3.0
- NMEA0183 Logger 1.0.1
- NMEA2000 Logger 1.0.0
- IMU Logger 1.0.0
- Serialiser 1.3

Metadata

Unique Identifier UNHJHC-dadfef2a-7b78-4262 Generate UUID

Ship Name R/V Development

Options

- NMEA0183 Logger
- NMEA2000 Logger
- IMU Logger
- Emergency Power Monitor
- SD/MMC Memory Controller
- UDP NMEA0183 Bridge
- Webserver On Boot

WiFi Configuration

Mode AP

Address 192.168.4.1

Station Join Configuration

Retry Delay (s) 20

Retry Count 5

Join Timeout (s) 5

Identification

AP SSID wibl-dev-config

AP Password wibl-config-password

Station SSID wibl-dev-logger

Station Password wibl-logger-password

NMEA0183 Baud Rates

Port 1 4800

Port 2 4800

UDP Bridge Port 12345

Query Logger Set Logger Load Config Save Config

Get Defaults Set Defaults Dismiss

WIBL Data Management Interface 1.0.0

Server

IP Address 192.168.4.1

Port 80

Command

Output

```

>>> status
{"version":{"commandproc":"1.3.0","nmea0183":"1.0.1","nmea2000":"1.0.0","imu":"1.0.0","serialiser":"1.3"},"elapsed":40399,"webserver":{"current":"AP-Enabled","boot":"AP-Enabled"},"files":{"count":5,"detail":[{"id":0,"len":763,"md5":"32CB987DD0E6C8C663088E5A94117FC1"}, {"id":1,"len":763,"md5":"32CB987DD0E6C8C663088E5A94117FC1"}, {"id":2,"len":763,"md5":"32CB987DD0E6C8C663088E5A94117FC1"}, {"id":3,"len":782,"md5":"44CB561E76F3C1999949634052057D60"}, {"id":4,"len":782,"md5":"44CB561E76F3C1999949634052057D60"}]}}
  
```

Status Summary:

Versions:

- CommandProc: 1.3.0
- NMEA0183: 1.0.1
- NMEA2000: 1.0.0
- IMU: 1.0.0
- Serialiser: 1.3

Elapsed Time: 46.926 s.

Webserver Status: AP-Enabled

Files On Logger: 5

Total File Size: 3.763 kB

Actions

Setup Status Metadata Algorithms NMEA0183 Filter Transfer Data Restart

```

var.get(), self.output_text)
server_port_var.get(), self.output_text)
  
```

Save Configuration

Save As: UNHJHC-dadfef2a-7b78-4262-9b1

Tags:

WIBL-testing

Folder shared with File Sharing

- 01-01-2023-full.json
- 01-01-2023-trim.json
- 01-01-2023.csv
- 01-12-2022-trim.json
- 01-12-2022.csv
- edited.wibl
- logger-algorithms.json
- sim-data-c++-wibl
- sim-data-python.wibl

New Folder Cancel Save

us-east-1.console.aws.amazon.com

Services Search [Option+S]

Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

- User groups
- Users
- Roles**
- Policies
- Identity providers
- Account settings

Access reports

- Access analyzer
- Archive rules
- Analizers
- Settings

Credential report

Organization activity

Service control policies (SCPs)

Related consoles

- IAM Identity Center New
- AWS Organizations

IAM > Roles

Roles (20) Info Refresh Delete Create role

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

Search

<input type="checkbox"/>	Role name	Trusted entities	Last acti...
<input type="checkbox"/>	AWSServiceRoleForAmazonElasticFileSystem	AWS Service: elasticfilesystem (Service-Linked Role)	22 days ago
<input type="checkbox"/>	AWSServiceRoleForBackup	AWS Service: backup (Service-Linked Role)	9 hours ago
<input type="checkbox"/>	AWSServiceRoleForECS	AWS Service: ecs (Service-Linked Role)	Yesterday
<input type="checkbox"/>	AWSServiceRoleForElasticLoadBalancing	AWS Service: elasticloadbalancing (Service-Linked Role)	22 days ago
<input type="checkbox"/>	AWSServiceRoleForOrganizations	AWS Service: organizations (Service-Linked Role)	-
<input type="checkbox"/>	AWSServiceRoleForSupport	AWS Service: support (Service-Linked Role)	-
<input type="checkbox"/>	AWSServiceRoleForTrustedAdvisor	AWS Service: trustedadvisor (Service-Linked Role)	-
<input type="checkbox"/>	ecsInstanceRole	AWS Service: ec2	-
<input type="checkbox"/>	ecsTaskExecutionRole	AWS Service: ecs-tasks	Yesterday
<input type="checkbox"/>	ExampleLambda-role-0nwshfy7	AWS Service: lambda	121 days ago
<input type="checkbox"/>	lambda-demo	AWS Service: lambda	265 days ago
<input type="checkbox"/>	logconvert-lambda	AWS Service: lambda	260 days ago
<input type="checkbox"/>	OrganizationAccountAccessRole	Account: 640188652737	-
<input type="checkbox"/>	pylyrtst-role-ivvmesxo	AWS Service: lambda	-
<input type="checkbox"/>	testarm-role-bkl2xv5x	AWS Service: lambda	-
<input type="checkbox"/>	testpy-role-wnu41qsf	AWS Service: lambda	-
<input type="checkbox"/>	TestSNS-role-80dq860f	AWS Service: lambda	40 days ago
<input type="checkbox"/>	unhjh-c-wibl-conversion-lambda	AWS Service: lambda	5 days ago
<input type="checkbox"/>	unhjh-c-wibl-submission-lambda	AWS Service: lambda	5 days ago
<input type="checkbox"/>	unhjh-c-wibl-validation-lambda	AWS Service: lambda	5 days ago

Roles Anywhere Info Manage

Authenticate your non AWS workloads and securely provide access to AWS services.

CloudShell Feedback Language © 2023, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

us-east-2.console.aws.amazon.com

Services Search [Option+S]

Lambda > Functions > unhjh-c-wibl-conversion

unhjh-c-wibl-conversion Throttle Copy ARN Actions

Function overview Info

unhjh-c-wibl-conversion

Layers (1)

SNS + Add destination

+ Add trigger

Description

Last modified 6 days ago

Function ARN [arn:aws:lambda:us-east-2:861459245588:function:unhjh-c-wibl-conversion](#)

Function URL [Info](#)

Code Test Monitor **Configuration** Aliases Versions

General configuration

Triggers

Permissions

Destinations

Function URL

Environment variables

Tags

VPC

Monitoring and operations tools

Concurrency

Asynchronous invocation

Code signing

Database proxies

File systems

Execution role Edit

Role name [unhjh-c-wibl-conversion-lambda](#)

Resource summary View role document

Amazon CloudWatch Logs 3 actions, 1 resource

To view the resources and actions that your function has permission to access, choose a service.

By action **By resource**

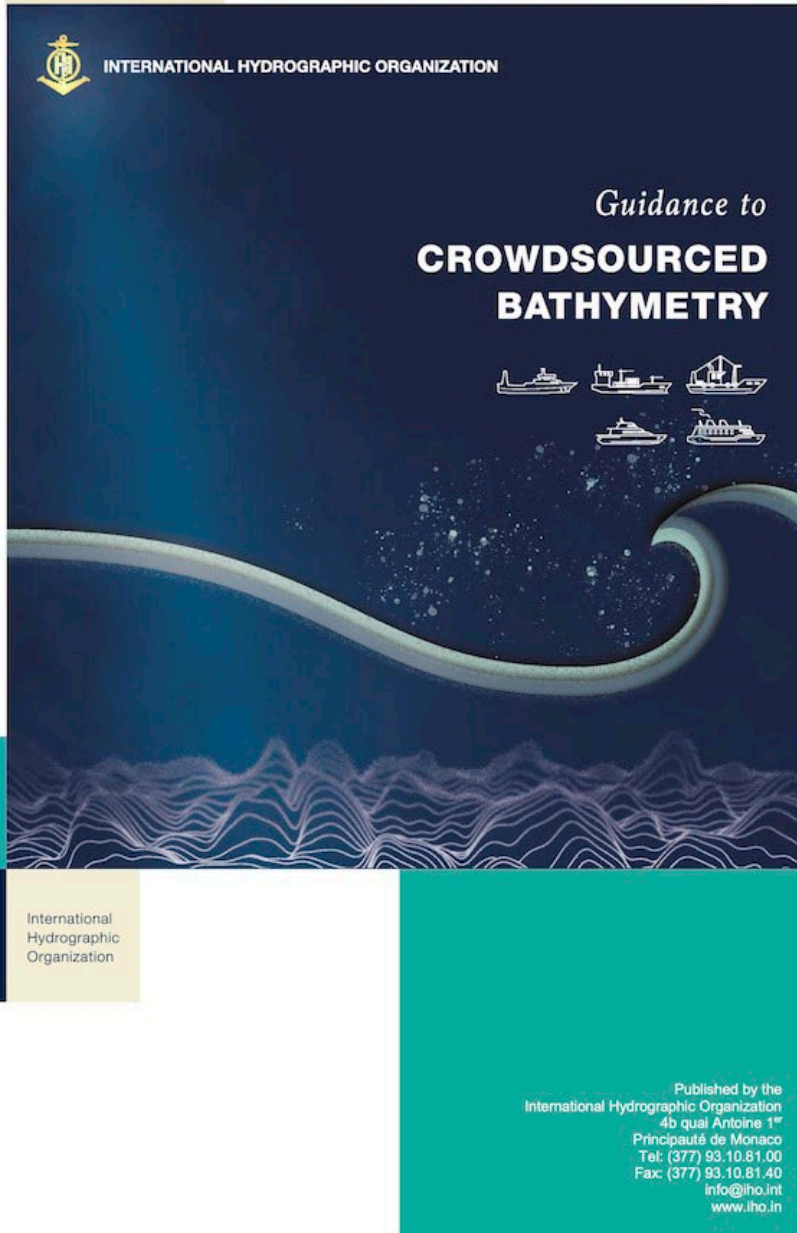
Resource	Actions
All resources	Allow: logs:CreateLogGroup Allow: logs:CreateLogStream Allow: logs:PutLogEvents

[Lambda obtained this information from the following policy statements:](#)

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```
configuration-parameters.sh — WIBL
$ configuration-parameters.sh
wibl-python > scripts > cloud > AWS > $ configuration-parameters.sh
1 # This provides information on the configuration of the lambdas
2 # being generated, the specification for the buckets being used,
3 # roles, and so on. This is a separate file so that it can be
4 # sourced by code to set up lambdas, and another to set up the
5 # buckets.
6
7 # Set this to your AWS account number (twelve-digit AWS account number)
8 ACCOUNT_NUMBER=$(aws sts get-caller-identity --query Account --output text)
9
10 # DCDB will issue you with a unique provider ID to identify your uploads. This is
11 # used in many different places in the code; set it here.
12 DCDB_PROVIDER_ID=LNHJHC
13
14 # The script needs to know where to find the WIBL source code so that it can package
15 # the Python library for upload to AWS. It also needs a place to stash the resulting
16 # package. Set those locations here.
17 WIBL_SRC_LOCATION=$(git rev-parse --show-toplevel)/wibl-python
18 WIBL_BUILD_LOCATION=$(WIBL_SRC_LOCATION)/awsbuild
19 mkdir -p ${WIBL_BUILD_LOCATION} || exit $?
20
21 # DCDB should provide you with a token to authorise you to upload; change this code
22 # so that it can find where you've stashed it, and read it in to allow for setup of
23 # the submission Lambda.
24 AUTHKEY=`cat ingest-external-${DCDB_PROVIDER_ID}.txt`
25
26 # These parameters configure the AWS region and technical details of the Lambda runtime
27 # that will be used. If you change the region, you will also want to change the SciPy
28 # layer name to reflect your local version. You can change the architecture and Python
29 # version, but note that not all combinations of these will result in a Lambda that can
30 # both get the SciPy later that it needs, and boot successfully.
31 AWS_REGION=$(aws configure get region)
32 ARCHITECTURE=x86_64
33 PYTHONVERSION=3.8
34 SCIPY_LAYER_NAME=arn:aws:lambda:us-east-2:259788987135:layer:AWSLambda-Python38-SciPy1x:107
35
36 # $WIBL_PACKAGE is the absolute path of the zip file containing the lambda code
37 WIBL_PACKAGE=$(WIBL_BUILD_LOCATION)/wibl-package-py${PYTHONVERSION}-${ARCHITECTURE}.zip
38
39 # -----
40 # Below here you probably don't need to change much
41
42 #DCDB_UPLOAD_URL=https://www.ngdc.noaa.gov/ingest-external/upload/csb/geojson/
43 DCDB_UPLOAD_URL=https://www.ngdc.noaa.gov/ingest-external/upload/csb/test/geojson/
44
45 PROVIDER_PREFIX=`echo ${DCDB_PROVIDER_ID} | tr '[:upper:]' '[:lower:]'`
46
47 CONVERSION_LAMBDA=${PROVIDER_PREFIX}-wibl-conversion
48 VALIDATION_LAMBDA=${PROVIDER_PREFIX}-wibl-validation
49 SUBMISSION_LAMBDA=${PROVIDER_PREFIX}-wibl-submission
50 CONVERSION_LAMBDA_ROLE=${CONVERSION_LAMBDA}-lambda
51 VALIDATION_LAMBDA_ROLE=${VALIDATION_LAMBDA}-lambda
52 SUBMISSION_LAMBDA_ROLE=${SUBMISSION_LAMBDA}-lambda
53
54 LAMBDA_TIMEOUT=30
55 LAMBDA_MEMORY=2048
56
```

```
configure-lambdas.sh — WIBL
$ configure-lambdas.sh
wibl-python > scripts > cloud > AWS > $ configure-lambdas.sh
25 #####
26 # Phase 2: Generate IAM roles for the conversion and submission roles, add policy support
27 #
28 echo $'\e[31mBuilding the IAM roles for lambdas ...e[0m'
29
30 cat > "${WIBL_BUILD_LOCATION}/lambda-trust-policy.json" <<-HERE
31 {
32   "Version": "2012-10-17",
33   "Statement": [
34     {
35       "Effect": "Allow",
36       "Principal": {
37         "Service": [
38           "lambda.amazonaws.com"
39         ]
40       },
41       "Action": "sts:AssumeRole"
42     }
43   ]
44 }
45 HERE
46
47 # Generate roles that allow lambdas to assume its execution role, one each for conversion & submission
48 aws --region ${AWS_REGION} iam create-role \
49   --role-name ${CONVERSION_LAMBDA_ROLE} \
50   --assume-role-policy-document file://${WIBL_BUILD_LOCATION}/lambda-trust-policy.json"
51 test_aws_cmd_success $?
52
53 aws --region ${AWS_REGION} iam create-role \
54   --role-name ${VALIDATION_LAMBDA_ROLE} \
55   --assume-role-policy-document file://${WIBL_BUILD_LOCATION}/lambda-trust-policy.json"
56 test_aws_cmd_success $?
57
58 aws --region ${AWS_REGION} iam create-role \
59   --role-name ${SUBMISSION_LAMBDA_ROLE} \
60   --assume-role-policy-document file://${WIBL_BUILD_LOCATION}/lambda-trust-policy.json"
61 test_aws_cmd_success $?
62
63 # Attach the ability to run Lambdas to these roles
64 aws --region ${AWS_REGION} iam attach-role-policy \
65   --role-name ${CONVERSION_LAMBDA_ROLE} \
66   --policy-arn arn:aws:iam:aws:policy/service-role/AWSLambdaBasicExecutionRole || exit $?
67
68 aws --region ${AWS_REGION} iam attach-role-policy \
69   --role-name ${VALIDATION_LAMBDA_ROLE} \
70   --policy-arn arn:aws:iam:aws:policy/service-role/AWSLambdaBasicExecutionRole || exit $?
71
72 aws --region ${AWS_REGION} iam attach-role-policy \
73   --role-name ${SUBMISSION_LAMBDA_ROLE} \
74   --policy-arn arn:aws:iam:aws:policy/service-role/AWSLambdaBasicExecutionRole || exit $?
75
76 # Create policy to allow lambdas to join our VPC
77 # Define policy
78 cat > "${WIBL_BUILD_LOCATION}/lambda-nic-policy.json" <<-HERE
79 {
80   "Version": "2012-10-17"
```



3.3 Metadata and Data Formats

This section provides guidance to data collectors and Trusted Nodes about the standard metadata that is required for submitting data to the IHO DCDB. In addition, it provides information about additional metadata that would enhance the value of the data for end users. CSB data contributors should collect and forward this information whenever possible. Recognizing that translating metadata fields to files for submission to the IHO DCDB can be complex, Trusted Nodes are encouraged to review the [CSB Sample Data Contribution Formats Document](#) which can be found on the IHO DCDB website²³, and includes the latest conventions and examples of acceptable data formats. The International System of Units (SI) should be used, with the allowed addition of knots (nautical miles per hour, specified to be exactly 1.852 km/h, or approximately 0.514 m/s). As such, depth and offsets measurements should be in metres.

3.3.1 Mandatory Metadata from Trusted Nodes

Trusted Nodes should assign additional metadata to crowdsourced bathymetry before they deliver data to the IHO DCDB. Table 1 lists metadata that Trusted Nodes should provide. Note that the Data Field, “Data License”, shall list only the “Creative Commons Zero” universal public domain dedication (CC0 1.0). More information on data licensing can be found in Chapter 5: [Additional Considerations](#).

Table 1. Trusted Node Metadata

Data Field	Description	Example
Provider Contact Point Organization Name	The Trusted Node's name, in free-text format.	Example Cruises Inc.
Provider Email	A free-text field for the Trusted Node's email address, so that data users can contact the Trusted Node with questions about the data.	support@example.com
Unique Vessel ID	Generated by the Trusted Node, this number identifies the Trusted Node and uniquely identifies the contributing vessel. The characters preceding the hyphen (-) identify the Trusted Node, followed by a hyphen (-), and then the vessel's unique identifier. The UUID assigned by the Trusted Node is consistent for each contributing vessel, throughout the life of service of the vessel. However, if the vessel chooses to remain anonymous to data users, the Trusted Node does not need to publish the	EXAMPLE-UUID

²³ ngdc.noaa.gov/iho/

	vessel name in association with the UUID.	
Convention	This field describes the format and version for the data and metadata, such as GeoJSON, CSV, or XYZT. Reference the version of the CSB data convention (e.g., CSB 2.0, CSB 3.0) where possible.	GeoJSON CSB 3.0
Data License	The Creative Commons public domain dedication under which the Trusted Node is providing CSB data to the IHO DCDB. Additional information on licensing can be found in Chapter 5: Additional Considerations.	CC0 1.0
Provider Logger	The software program or hardware logger used to log the data.	Rose Point ECS
Provider Logger Version	The software or hardware logger version.	1.0
CRS of navigation data	The EPSG code referring to the Coordinate Reference System (CRS) of the navigation data	EPSG: 4326
Vertical reference of depth	The vertical reference of the depth. The vertical reference will most likely be the transducer (ex: NMEA DBT string) or the waterline (ex: NMEA DPT string).	Transducer/Unknown
Vessel Position Reference Point	Position Reference Point (PRP) is the reference point where the navigation data is output. Most likely the reference point will be the location of the GNSS antenna.	GNSS / Transducer / ReferencePlate

3.3.2 Mandatory Data

A minimum of information is required to enable crowdsourced bathymetry to be accepted by the IHO DCDB. Table 2 lists the mandatory information.

Table 2. Mandatory Information

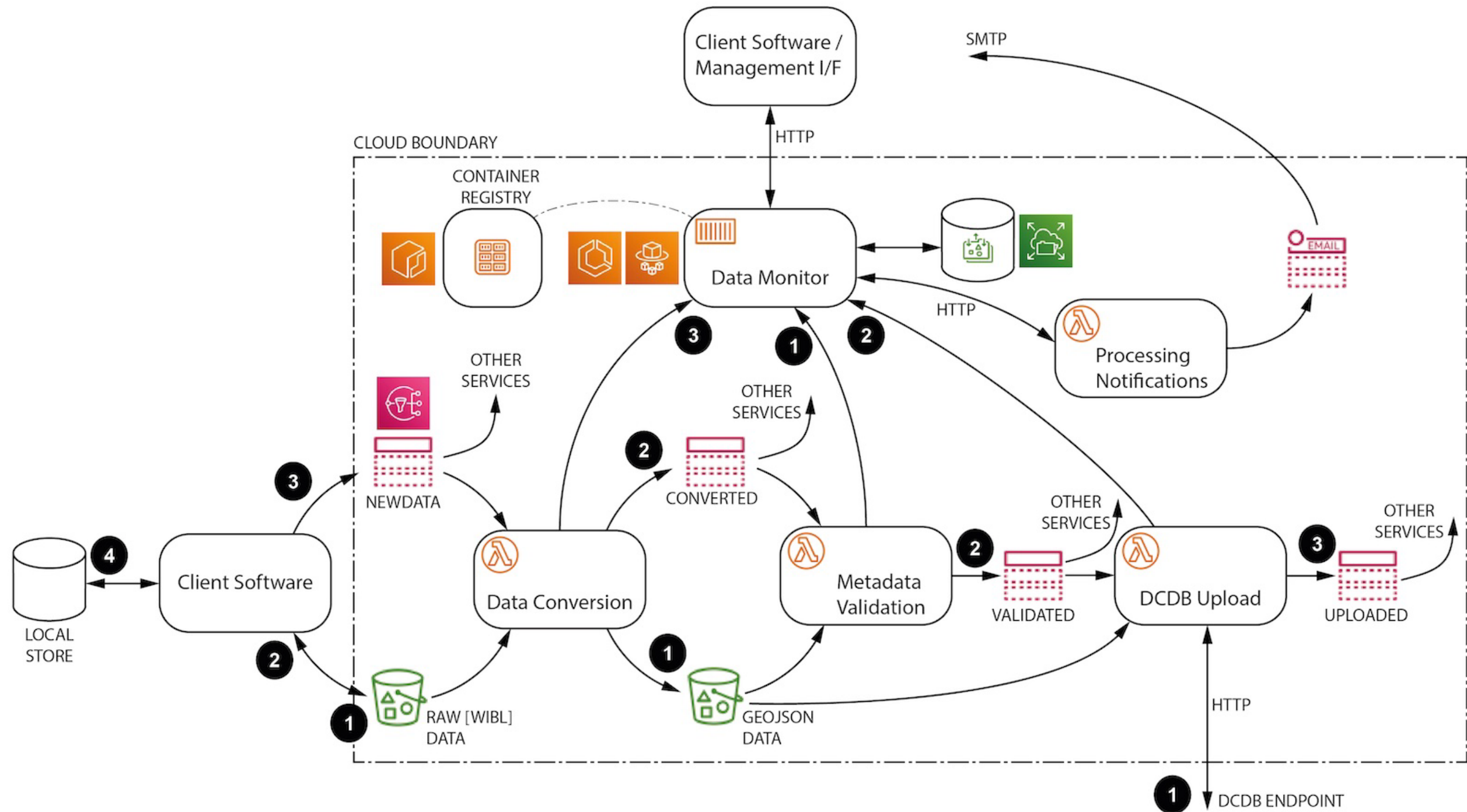
Data Field	Description	Example
Longitude	The vessel's PRP (Position Reference Point) longitude, in decimal degrees, to a precision of six decimal places. This can be extracted from the NMEA GGA, GGL or RMC String. Negative values are in the western hemisphere, positive values	-19.005236

<https://github.com/CCOMJHC/csbschema>

```

{
  "type": "FeatureCollection",
  "crs": {
    "type": "name",
    "properties": {
      "name": "EPSG:4326"
    }
  },
  "properties": {
    "trustedNode": {
      "providerOrganizationName": "CCOM/JHC, UNH",
      "providerEmail": "wibl@ccom.unh.edu",
      "uniqueVesselID": "UNHJHC-0c2c3f58-24a4-448f-a538-ccca22993ed7",
      "convention": "GeoJSON CSB 3.1",
      "dataLicense": "CC0 1.0",
      "providerLogger": "WIBL",
      "providerLoggerVersion": "1.0/1.0.0/1.0.1",
      "navigationCRS": "EPSG:4326",
      "verticalReferenceOfDepth": "Waterline",
      "vesselPositionReferencePoint": "GNSS"
    },
    "platform": {
      "uniqueID": "UNHJHC-0c2c3f58-24a4-448f-a538-ccca22993ed7",
      "type": "Ship",
      "name": "USCGC-Healy",
      "IDType": "IMO",
      "IDNumber": "IM09083380",
      "soundSpeedDocumented": true,
      "positionOffsetsDocumented": true,
      "dataProcessed": true,
      "length": 128,
      "sensors": [
        {
          "type": "Sounder",
          "make": "Kongsberg Maritime",
          "model": "EM122",
          "position": [
            1.2345,
            1.2345,
            -1.2345
          ],
          "draft": 8.9,
          "draftUncert": 0.2,
          "frequency": 12000
        },
        {
          "type": "GNSS",
          "make": "Applanix",
          "model": "POS/MV 320",
          "version": "5",
          "position": [
            0.0,
            0.0,
            0.0
          ]
        },
        {
          "type": "IMU",
          "make": "Garmin",
          "model": "IBU-100",
          "version": "5",
          "position": [
            0.0,
            0.0,
            0.0
          ]
        }
      ]
    }
  }
}

```



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Research Professor & Associate Director

Brian Miles (bmiles@ccom.unh.edu)

Senior Research Project Engineer

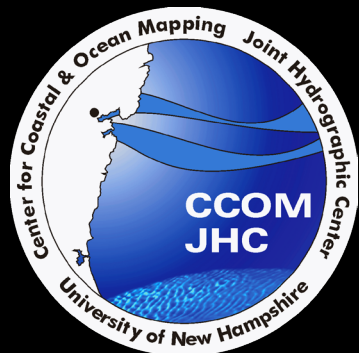
WIBL



<https://bitbucket.org/ccomjhc/wibl/src/master/>

<https://github.com/CCOMJHC/csbschema>

CSBSchema



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"Continuation of the Joint Hydrographic Center"**

