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Hydrologic Monitoring Reporting Format

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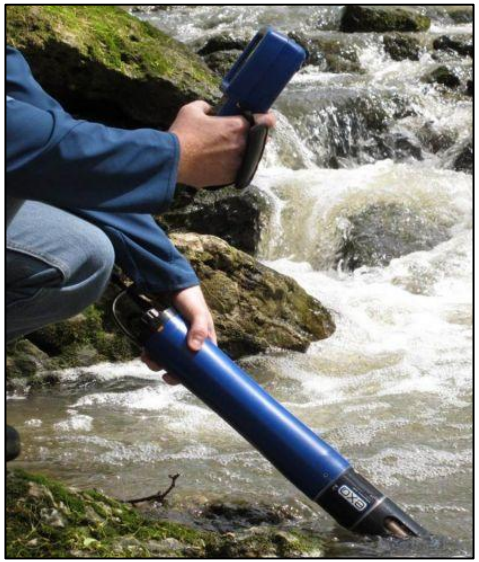
https://github.com/ess-dive-community/essdive-hydrologic-monitoring

ESS-DIVE Community Data Workshop

U.S. DEPARTMENT OF ENERGY BATTELLE

PNNL is operated by Battelle for the U.S. Department of Energy

Scope: sensors for in-situ water measurements



Specific parameters:

- “Water level”
- Temperature
- Electrical conductivity
- Specific conductivity
- Dissolved oxygen
- pH

www.xylem-analytics.com.au%2Fproductsdetail.php%3FYSI-EXO2-Multiparameter-Sonde

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Reporting format includes ten components

Instructions

List of recommended vocabulary

Pre-populated files to comply with other ESS-DIVE reporting formats

Data file template

Location metadata template

Sensor metadata template

User populates three files to comply with hydro RF and five files to comply with other RFs

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The five files to comply with other RFs are pre-populated to reduce workload for the user

File Level Metadata

File Level Metadata
Data Dictionary

Data File
Data Dictionary

Location Metadata
Data Dictionary

Sensor Metadata
Data Dictionary

Files support compliance with File Level Metadata Reporting Format and CSV Reporting Format

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Templates contain required and optional fields

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Example of data file with only required fields

# headerRows_4	
# column: DateTime | units: YYYY-MM-DD hh-mm-ss | UTC offset: +0	
# column: WaterTemp | units: degrees celsius | MethodID_Location: Well4-3_01 | MethodID_Sensor: DO_012	
DateTime	*[Example sensor data]* **WaterTemp**
2020-05-14 13:30	13.1
2020-05-14 13:45	13.2
2020-05-14 14:00	13.1

Method IDs allow linking between data and methods information in the metadata files

# headerRows_4	
# column: DateTime | units: YYYY-MM-DD hh-mm-ss | UTC offset: +0	
# column: WaterTemp | units: degrees celsius | MethodID_Location: Well4-3_01 | MethodID_Sensor: DO_012	
DateTime	*[Example sensor data]* **WaterTemp**
2020-05-14 13:30	13.1
2020-05-14 13:45	13.2
2020-05-14 14:00	13.1

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Example of data file with all fields

# headerRows_5					
# column: DateTime | units: YYYY-MM-DD hh-mm-ss | UTC offset: +0					
# column: WaterTemp | units: degrees celsius | MethodID_Location: Well4-3_01 | MethodID_Sensor: DO_012					
# column: DissolvedOxygen | units: milligrams per liter | MethodID_Location: Well4-3_01 | MethodID_Sensor: DO_012					
DateTime	**WaterTemp**	**WaterTemp_MethodDeviation**	**DissolvedOxygen**	**DataFlag**	**Notes**
2020-05-14 13:30	13.1	N/A	10.2	N/A	Continuation of prior deployment. 10m depth.
2020-05-14 13:45	13.2	N/A	6.1	DataFlag_01	N/A
2020-05-14 14:00	13.1	Temp_002	-9999	N/A	Removed sonde and replaced with new sensor. No DO.

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Example of location methods metadata with required fields

MethodID_Location	MethodDescription_Location
Well-4-3_01	Deployed from top of well casing to 10 m depth. Top of well screen is at 30 m depth from top of casing and extends down 3 m.
Tow_01	Sensor towed from boat along the surface of the Columbia River. Latitude/longitude of each time point is reported in data file.

Example of location methods metadata with all fields

MethodID_Location	MethodDescription_Location	Latitude	Longitude	Depth	Depth_Reference	Elevation	Elevation_Reference	DateTime_Start	DateTime_End	UTC_Offset	Deployment_Environment	Deployment_Configuration	Water_Name	Site_Name	Site_ID
Well-4-3_01	Deployed from top of well casing to 10 m depth. Top of well screen is at 30 m depth from top of casing and extends down 3 m.	43.3195	-119.2593	10	Meters below ground surface	104.5	Meters above mean sea level (NAVD88)	2021-04-20 13:00	2021-04-22 15:00	0	groundwater [ENVO:01001004]	Well	Hanford aquifer	Hanford 300 Area	399-4-3
Tow_01	Sensor towed from boat along the surface of the Columbia River. Latitude/longitude of each time point is reported in data file.	-9999	-9999	-9999	N/A	-9999	N/A	2021-05-02 8:00	2021-05-02 11:30	-2	freshwater river [ENVO:01000297]	Open water column	Columbia River	N/A	N/A

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Example of sensor methods metadata with required fields

MethodID_Sensor	MethodDescription_Sensor
DO_012	Temperature and dissolved oxygen logged at 15 minute intervals. See DO_calib.txt for description of calibration protocol.
Temp_002	Temperature logged at 15 minute intervals.
YSI_04	Multi-parameter sonde logging temperature, dissolved oxygen, pH, specific conductance, and nitrate every 90 seconds.

Example of sensor methods metadata with all fields

MethodID_Sensor	MethodDescription_Sensor	DateTime_Start	DateTime_End	UTC_Offset	MethodID_Location	Instrument
DO_012	Temperature and dissolved oxygen logged at 15 minute intervals. See DO_calib.txt for description of calibration protocol.	2021-04-22 13:30	2021-04-22 15:00	0	Well-4-3_01	YSI EXO2 with EXO Optical Dissolved Oxygen Smart Sensor (599100-01)
Temp_002	Temperature logged at 15 minute intervals.	2021-04-20 13:00	2021-04-20 16:00	0	Well-4-3_01	Campbell Scientific CS547A (SN 9431)
YSI_04	Multi-parameter sonde logging temperature, dissolved oxygen, pH, specific conductance, and nitrate every 90 seconds.	2021-05-02 8:00	2021-05-02 11:30	-2	Tow_01	YSI EXO2

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Do you have ideas, questions, or concerns?

Would you like to talk through how this might apply to your data?

Email Amy.Goldman@pnnl.gov

The more community input, the better.

https://github.com/ess-dive-community/essdive-hydrologic-monitoring