

# Overview of NHDES' SADB

## 2023 National Training Workshop on Water Quality Data, Assessment, and Plans

### Session #5 - Examples of Water Quality Assessment Tools

June 22<sup>nd</sup>, 2023



# Who you will hear from today



**Matt Wood**, NHDES Water Quality Assessment Program Coordinator



# What is the SADB?

- Supplemental Assessment Database
- Oracle based
- Built by NHDES/OIT staff (circa 2006)
- Originally built to talk to EPA's ADB





Wait, where's the info & data?



# Wait, where's the info & data?

- Environmental Monitoring Database (EMD)
  - All assessment unit data and sampling data is housed in our EMD.
    - Stations
    - Activities (sampling data)
    - Waterbody details (assessment units)
- Not everything in the EMD is used for assessments

# Wait, where's the info & data?

MENUCLOSE TABSCLOSE ALL BUT THISEXIT APP

◀ Waterbody Information Detail ▶

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**\* Waterbody ID**

Size

Units

**\* Waterbody Name**

Waterbody Alias	Type
PUDDING POND	

Town	County	State	Primary
CONWAY	CARROLL	NH	Y

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**\* Waterbody Type**

Public

Public Water Supply

Class  **\* Active**

Fishery

In White Mtn NF

Latitude  Longitude

HUC Code	HUC Name	Primary
010600020302	LOWER BARTLETT-NORTH CONWAY TRIBUTARIES	Y

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Waterbody Description

Designated River <input type="text" value=""/>	Elevation (ft) <input type="text" value="530.0"/>	Shoreline Length (m) <input type="text" value="1600"/>	Maximum Water Depth (m) <input type="text" value="0.8"/>	Mean Water Depth (m) <input type="text" value="0.3"/>
Surface Area (Hectares) <input type="text" value="5.99"/>	Watershed Area (Hectares) <input type="text" value="266.8"/>	Volume (m3) <input type="text" value="16000"/>	Areal Water Load (m/yr) <input type="text" value="27.12"/>	% Watershed Poned <input type="text" value="0"/>
Flushing Rate (#times/yr) <input type="text" value="102.0"/>	Phosphorous Ret. Coeff. <input type="text" value="0.44"/>	Lake Type <input type="text" value="NATURAL"/>	Salt Pond <input type="text" value="N"/>	Not Inventoried <input type="text" value="N"/>
Surrounded by private land (no access given) <input type="text" value="N"/>	Multiple Segments for lake <input type="text" value="N"/>	Not True Pond For CLP <input type="text" value="Y"/>	Wetland <input type="text" value="Y"/>	Inaccessible <input type="text" value="N"/>

Waterbody Comments

Biology Lake  Beach?  Date Added  Date Modified  User  Best Trophic Class

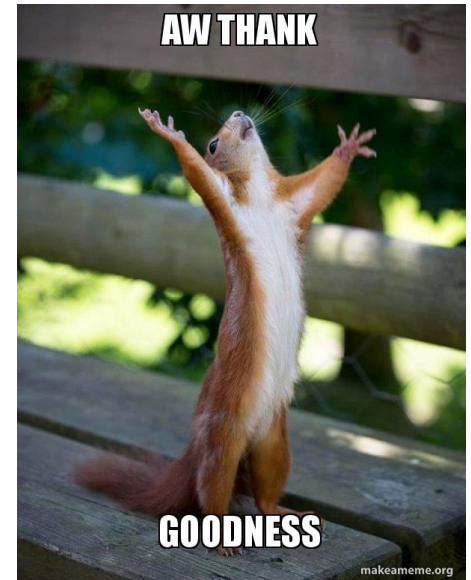
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Assign HUCAssign Town(s)Assign Dam : 0Assign AliasesHistoryPrint Parent SSRS ReportAssociate WaterbodyDeleteModify

Print Child SSRS Report

# Let's explore the EMD

- 61,725 Stations in the EMD.
- Only 11,984 are AU verified and used in assessments.



# Let's explore the EMD

**Station Detail**

**Station ID:** 00-BRY    **Alias ID:**    **Station Name:** BERRY RIVER RD    **Address:**    **Transect:**

**Town:** BARRINGTON    **County:** STRAFFORD    **State/Province:** NH    **Tax Map:**    **Tax Lot:**

**Type:** RIVER/STREAM    **Date Established:** Select a date [15]    **Weather Station?**

**Waterbody Name:** BERRY RIVER - FROM LONG POND TO ISINGLASS RIVER    **Waterbody ID:** NHRIV600030606-06

**Class:** B    **HUC Code (12):** 010600030606    **HUC Name:** LONG POND

**Designated River Reach:**    **Related Lake:**    **Related Lake Waterbody ID:**

**Final Discharge:**    **Water Depth:**    **Units:**    **River Name:** BERRYS R

**Station Description:**

**Directions to Station:** 126 BERRY RIVER ROAD - PRIVATE DRIVE

**Latitude:** 43.243478    **Longitude:** -71.082928    **Date Located:** Select a date [15]

**Location Method:** INTERPOLATION-MAP    **Map Scale:** 1:24,000    **Datum:** NORTH AMERICAN DATUM 1983

**GPS Unit:**    **Horizontal Accuracy (m):** 60    **NHD Eoffset:** 3.6646    **NHD Pmeasure:** 84.068    **NHD Reach Code:** 010600030051    **NHD Resolution:** HIGH    **NHD SM Date:** 10/4/2005 [15]

**Elevation:**    **Units:**    **Elevation Method:**    **Elevation Datum:**    **Record Complete?** Y

**Station AU Verified?** Y    **Active?** Y    **Date Modified:** 01/06/2016    **Date Sent to WQX:** 8/5/2016 [15]    **WQX Change Date:** 1/6/2016 [15]    **User:** WDKMG2    **Import Flag:** I

**Assoc. Projects:**    **Well Detail:** 0    **Activity(s):** 23    **Shellfish Property(s):** 0    **Beach(s):** 0

**Delete:**    **Modify:**    **Items:** 0    **Data Logger(s):** 1    **Shellfish Source(s):** 0    **Complaint(s):** 0



# Let's explore the EMD

MENU  
☰

CLOSE  
TABS  
✖

CLOSE ALL  
BUT THIS  
✖

EXIT  
APP  
➡

◀
Activity Detail
▶

Delete Act/Rslts

Station ID

Station Name

Town

State

\* Activity/  
Sample ID

\*Type

Rep Number

Sample Collection Method

\*Medium

Tissue Anatomy

Taxonomic Name

Transplant Date

Habitat Form Type

\* Start Date

Start Time

Stop Date

Stop Time

Data Status

Personnel

Rain Prior 3 Days?

Waterbody ID

Activity Depth Info

Sample Depth

Depth Units

Depth Meas. From

Upper Depth

Lower Depth

Range Units

Depth Zone

Filtered

Flushed/Purged

Treatment

Activity Comments

**Sample Receipt Info**

Date Rec'd By Lab

Time

Temp of Samples at Arrival (C)

Exception to Sample Receipt Procedures?

Sample Receipt Comments

Parameter	Text	Qualifier	Numeric	Units	Reporting Detection Limit	MDL	Detection Limit Units
DISSOLVED OXYGEN			6.84	MG/L			
DISSOLVED OXYGEN SATURATION			71.1	%			
PH			5.46	NONE			
SPECIFIC CONDUCTANCE			66.8	UMHO/CM			
TEMPERATURE WATER			16.9	DEG C			
TURBIDITY			1.35	NTU			

Total Price

Invoice#

Billing Code

Record Complete?

Y

Import Flag

N

Date Modified

Date WQX Change

Date Sent to WQX

User

Add (Result)

M<sub>o</sub>dify

Delete

Assign Project(s)

Assign Activity

Station

QC Sample

Let's explore the SADB

**AND NOW BACK TO YOUR**

**REGULAR SCHEDULED PROGRAM**

# Let's explore the ADB

ADB

### Cycle Selection

DESPRD.DES

Please Enter Cycle Year:

2000  
2001  
2006  
2008  
2010  
2012  
2014  
2016  
2018

Go

### DESPRD.DES - 2020

Load Standards Table

View Standards Table

Regional Site Thresholds

Load Datalogger SPC

Create Waterbody Base for this Cycle

Compare against Standards

Compare SPC against Standards

Build Waterbody Details

Build Summary Tables

TP/CHLa Median Calculation

GEOMEAN Calculation

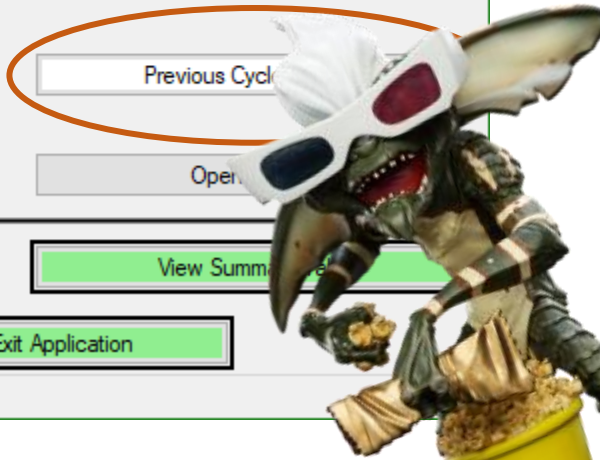
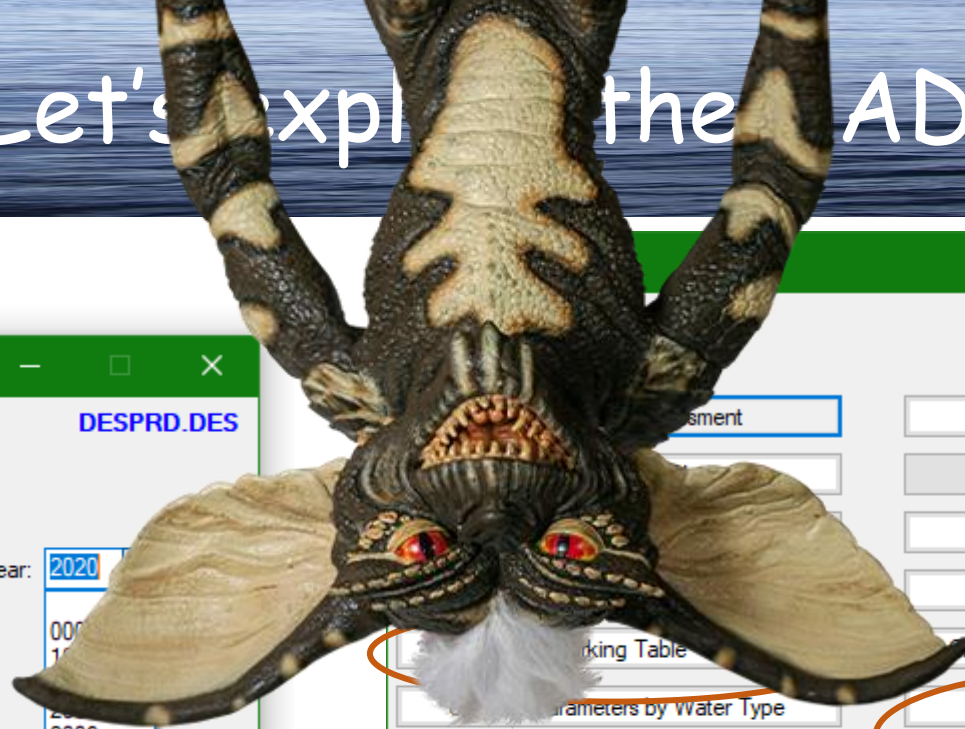
Previous Cycle

Open

Items

View Summary

New Cycle /Exit Application





# Let's explore the SADB





# Let's explore the SADB

- Processes sample level data against our state water quality standards, which gives us counts of...
  - FS (full support)
  - NS (non-support)
  - II (insufficient information)
- 5 million standard comparisons  
Per cycle



# Let's explore the SADB



# Let's explore the SADB

The screenshot displays the SADB (Stream Assessment Data Base) software interface. The main window is filled with a data table containing columns for station ID, date, and various parameters. The interface is divided into several sections:

- Top Menu Bar:** Includes options like 'FILE', 'EDIT', 'VIEW', 'DATA', 'REPORTS', 'HELP', and 'ABOUT'.
- Main Data Table:** A large grid of data points with columns for station ID, date, and various parameters.
- Central Panel:** Contains three line graphs showing 'CONCENTRATION RIVER - LOWER FALLEN DAM TO HICKMAN'S' for 'MEANS', 'GRAB SAMPLES', and 'GRAB SAMPLES' over time. The graphs show data points and trend lines.
- Right Panel:** Contains 'Export Plots as JPEGs' and a list of data points with columns for 'Station ID', 'Date', 'Concentration', 'Flow', 'Temperature', 'Dissolved Oxygen', 'pH', 'Turbidity', 'Total Suspended Solids', 'Total Phosphorus', 'Total Nitrogen', 'Ammonia Nitrogen', 'Nitrate Nitrogen', 'Nitrite Nitrogen', 'Total Ammonia Nitrogen', 'Total Phosphorus', 'Total Nitrogen', 'Ammonia Nitrogen', 'Nitrate Nitrogen', 'Nitrite Nitrogen', 'Total Ammonia Nitrogen'.

A small inset image in the bottom right corner shows a man looking through binoculars, suggesting a field observation or data collection activity.

# Let's explore the SADB

**ADB** \_ □ ×

## Summary Table by Assessment Unit and Use DESPRD.DES - 2020

Row: 3 of 6

AUID:  Size:  Units:  Waterbody Type:   
 Designated Use:  Waterbody Name:   
 ADB Category:  Waterbody Description:

Class:  Fishery:  Beach:  Public WS:  Abbr AUID:  Best Trophic Class:

Assess Unit: 5-M - Parameter is a pollutant that requires a TMDL. The impairment is marginal. (DES Category)  
 AU Comments:   
 Use Level: 5-M - Parameter is a pollutant that requires a TMDL. The impairment is marginal. (DES Category)  
 Use Comments:

### Summary Final Table Total Summary Final Rows: 7

ADB Parameter Name	DES Category	Dist	Threats Use	Parm Cmnts	YY Exp to Meet Stds	DES Intrnl Cmnts	Most Rnt Exceed	Most Rnt Sample	TMDL Priority	TMDL Sched	DES Pollutant	Next Sample Date	In Prev ADB	In Curr ADB	Catego Assgn Date
AMMONIA (TOTAL)	3-ND		N				N/A	2008			Y		N	N	02/18/21
CHLORIDE	5-M		N	2014: Samples c...			2019	2019	LOW	2027	Y		N	N	02/13/21
DISSOLVED OXYGEN SATURATION	5-M		N	2020: Twenty of ...			2017	2019	LOW	2033	Y		N	N	08/03/21
OXYGEN, DISSOLVED	5-M		N	2020: Six of 37 (...)			2017	2019	LOW		Y		N	N	06/09/21
PH	5-M		N				2018	2019	LOW	2023	Y		N	N	02/18/21
PHOSPHORUS (TOTAL)	3-ND		N				NLV	2009			Y				02/12/21
TURBIDITY	3-PAS		N				2015	2019			Y		N	N	02/19/21

Total Summary Interim Rows: 203

### Comparison Counts per Highlighted Row

Standard Name	Exceed ences	Insuff Info	Fully Support
FW_ACUTE	0	0	2
FW_CHRONIC	0	0	2

Full Comparison Description	Sample Year	Project Id	Use	Comments	# of Samples	10% Rule	Date Modified	User
AMMONIA_T-OR-D-GRAB-REVIEW NEEDED	2008	VRAP	Y		2	2	01/22/2020	WSMAW
CHLORIDE_T-OR-D_F-NCP	2008	VRAP	Y		1	2	01/22/2020	WSMAW
CHLORIDE_T-OR-D_S/F-CP	2008	VRAP	Y		2	2	01/22/2020	WSMAW
CHLORIDE_T-OR-D_S/S-NCP	2009	VRAP	Y		1	2	01/22/2020	WSMAW
CHLORIDE_T-OR-D_W/S-CP	2009	VRAP	Y		1	2	01/22/2020	WSMAW
CL BY SPC-COND-F-NCP-STATE	2019	VRAP	Y		1	2	01/22/2020	WSMAW
CL BY SPC-COND-F-NCP-STATE	2018	VRAP	Y		1	2	01/22/2020	WSMAW
CL BY SPC-COND-F-NCP-STATE	2017	VRAP	Y		1	2	01/22/2020	WSMAW

Items : 0



# Let's explore the SADB

ADB \_ □ ×

## Evaluate Assess Table by Assessment Unit and Use

DESPRD.DES - 2020 Return

AUID:

Designated Use:

ADB Category:

Use Level:  (DES Category)

Size:  Units:  Waterbody Type:

Waterbody Name:

Waterbody Description:

Class:  Fishery:  Beach?:  Public WS:  Abbr AUID:

Assess Unit:  (DES Category) Best Trophic Class:

**Data Used in Summary** Total Rows: 1280 Displayed Rows: 1280

Parameter	Start Date	Start Time	Adjusted Result	Statistic Type	Use	Depth	Depth Units	Hardness	Station Id	Project Id	Fraction Type	Original Result	Sample Size	QC Level	Record Comments	Result Row Calc	Valid
CALCIUM	08/16/2008	10:20	9370		Y	0	M		01-WDY	VRAP	DISSO...	9.37 M...		3			Y
CALCIUM	10/17/2008	10:20	8140		Y	0	M		01-WDY	VRAP	DISSO...	8.14 M...		3			Y
CARBON, ORGANIC	08/16/2008	10:20	7.97		Y	0	M		01-WDY	VRAP	DISSO...	7.97 M...		3			Y
CARBON, ORGANIC	10/17/2008	10:20	8.82		Y	0	M		01-WDY	VRAP	DISSO...	8.82 M...		3			Y
CHLORIDE	08/16/2008	10:20	83930		Y	0	M		01-WDY	VRAP	DISSO...	83.93 ...		3			Y
CHLORIDE	08/16/2008	10:20	100000		Y	0	M		01-WDY	VRAP	TOTAL	=100 ...		3			Y
CHLORIDE	10/17/2008	10:20	84610		Y	0	M		01-WDY	VRAP	DISSO...	84.61 ...		3			Y
CHLORIDE	03/13/2009	08:25	100000		Y	0	M		01-WDY	VRAP	TOTAL	=100 ...		3			Y
CHLORIDE	03/20/2009	08:23	54000		Y	0	M		01-WDY	VRAP	TOTAL	=54 M...		3			Y
DISSOLVED OXYGEN	04/18/2008	10:20	11.89		Y	0	M		01-WDY	VRAP		11.89 ...		3			Y
DISSOLVED OXYGEN	05/17/2008	10:22	10.20		Y	0	M		01-WDY	VRAP		10.2 M...		3			Y

Modify Used Parameter:

**Data NOT Used in Summary** Total Rows: 24 Displayed Rows: 24

Parameter	Start Date	Start Time	Adjusted Result	Statistic Type	Use	Depth	Depth Units	Hardness	Station Id	Project Id
CHLORIDE	11/29/2012	14:30	210000		N	0	M		01-WDY	VRAP
DISSOLVED OXYGEN	06/20/2010	09:25	7.95		N	0	M		01-WDY	VRAP
DISSOLVED OXYGEN	07/16/2011	09:50	7.47		N	0	M		01-WDY	VRAP
DISSOLVED OXYGEN	05/24/2019	09:45	8.89		N				01-WDY	VRAP
DISSOLVED OXYGE...	06/20/2010	09:25	82.40		N	0	M		01-WDY	VRAP
DISSOLVED OXYGE...	07/16/2011	09:50	80.60		N	0	M		01-WDY	VRAP
DISSOLVED OXYGE...	07/21/2017	13:00	77.329...	MEAN	N	0.15	M		01-WDY	VRAP

Modify Not Used Parameter:

**Comparison Counts per Highlighted Row USED in Summary**  
Key: 0 = FS 1 = NS 2 = II

Standard Name	Comp Result	Std Value
CHLORIDE_T-OR-D_S/F-CP		
FW_ACUTE	0	860000
FW_ACUTE_MAGEX	0	1720000
FW_CHRONIC	0	230000

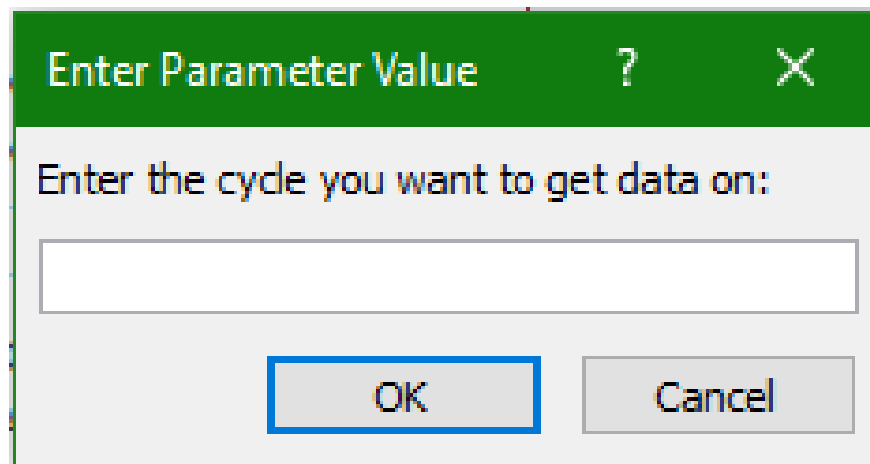
# Reporting to ATTAINS

- NH uses the upload templates to submit data to ATTAINS
- Data is pulled from both the EMD and SADB through MS Access
- Most are straightforward, pulling data from one or two tables
- Parameters, with their assessed categories is by far the most complex



# Reporting to ATTAINS

- Now that the quires are built, all I need to do is select a cycle



The image shows a screenshot of a software dialog box. The title bar is green and contains the text "Enter Parameter Value" followed by a question mark icon and a close (X) icon. The main area of the dialog is light gray and contains the text "Enter the cycle you want to get data on:" above a white text input field. At the bottom of the dialog, there are two buttons: "OK" and "Cancel". The "OK" button is highlighted with a blue border.



# Reporting to ATTAINS

- The query will generate a report with all the correct data fields and values

ASSESSMENT_UNIT_ID	PARAM_USE_NAME	PARAM_NAME	PARAM_STATUS_NAME	PARAM_ATTAINMENT_CODE	PARAM
NHEST600030902-01-03	Aquatic Life Integrity	ARSENIC	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BENZO[A]ANTHRACENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BENZO[A]PYRENE (PAHS)	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BENZO[B]FLUORANTHENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BENZO[G,H,I]PERYLENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BENZO[K]FLUORANTHENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BETA-ENDOSULFAN (ENDOSULFAN 2)	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	BIPHENYL	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	CADMIUM	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	CHLOROPHYLL-A	Cause	Not meeting criteria	
NHEST600030902-01-03	Aquatic Life Integrity	CHRYSENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	COLORED DISSOLVED ORGANIC MATTER (CDOM)	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	COPPER	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	DIBENZ[A,H]ANTHRACENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	DIELDRIN	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	DISSOLVED ORGANIC CARBON (DOC)	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	DISSOLVED OXYGEN	Cause	Not meeting criteria	
NHEST600030902-01-03	Aquatic Life Integrity	DISSOLVED OXYGEN SATURATION	Cause	Not meeting criteria	
NHEST600030902-01-03	Aquatic Life Integrity	ENDOSULFAN SULFATE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	ENDRIN	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	ESTUARINE BIOASSESSMENTS	Cause	Not meeting criteria	
NHEST600030902-01-03	Aquatic Life Integrity	FLUORANTHENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	FLUORENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	HEXACHLOROBENZENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	INDENO[1,2,3-CD]PYRENE	Insufficient Information	Not enough information	
NHEST600030902-01-03	Aquatic Life Integrity	IRON	Insufficient Information	Not enough information	

# Reporting to ATTAINS

- Those files are then exported as .csv files
- Batch uploaded through ATTAINS

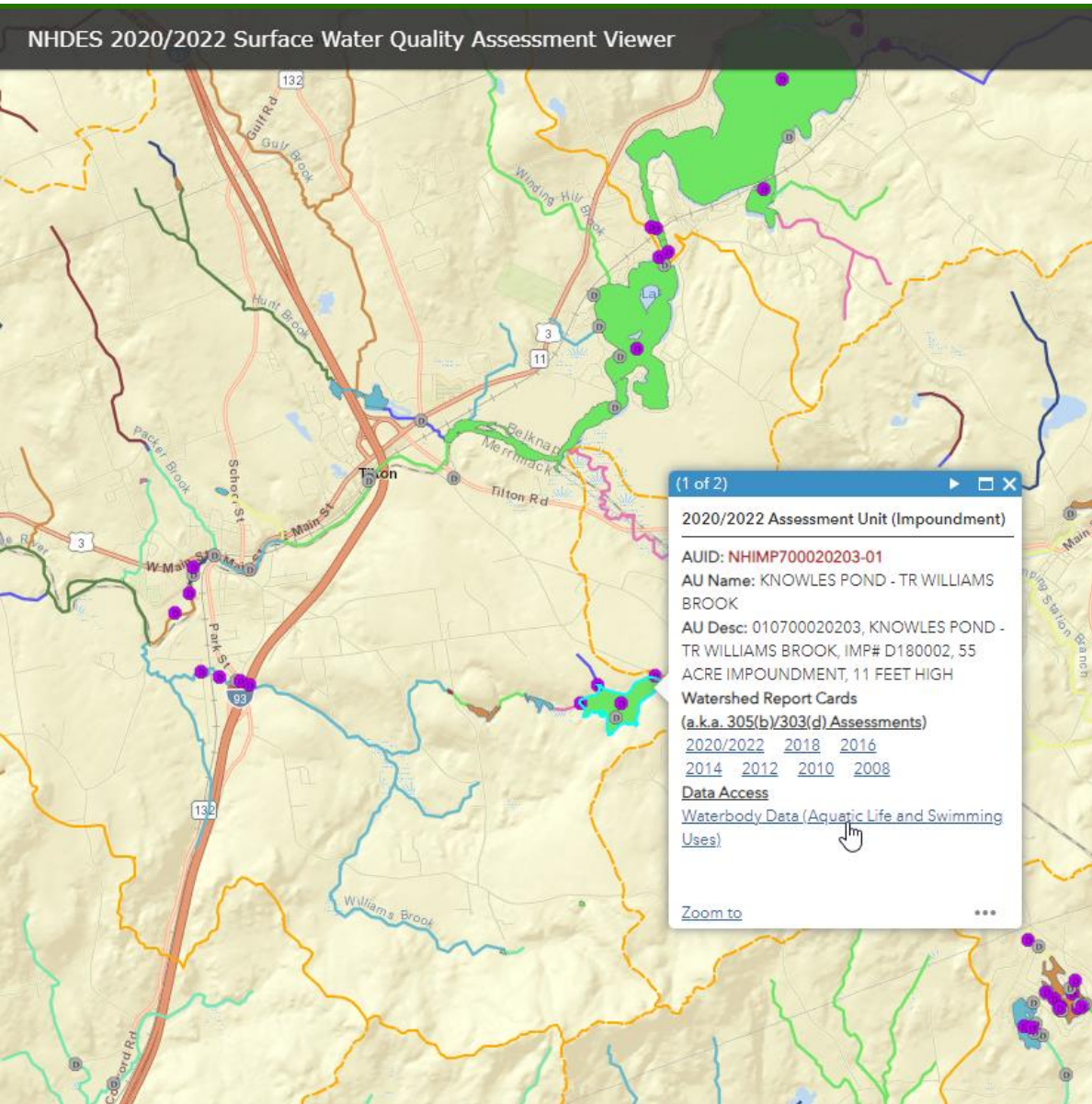




# Getting Info to the Public

## Biennial Assessments

Explore all the information on assessed waterbodies; guidance on...



atus of all assessed waterbodies; guidance on...



# Thank you!

**Matt Wood**, Water Quality Assessment Program Coordinator  
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<https://www.des.nh.gov/water/rivers-and-lakes/water-quality-assessment>

