

## Freshwater Outline/Agenda

### **3. Remote Sensing for Freshwater Habitats**

Dates: June 2019

Type: Introductory Webinar

End-Users: Local, regional, state, federal, and non-governmental organizations involved in conservation, habitat restoration, freshwater health, riparian landscapes, and climate change impacts on freshwater ecosystems.

Trainer: Cindy Schmidt (lead), Amber McCullum + guest speaker (lite)

Description: This training will focus on the use of remote sensing for managing freshwater habitats, including the combination of in-situ data with ecological variables to identify and monitor the health of habitats for important fish species. This training will describe several projects that combine environmental DNA with remote sensing variables to monitor fish populations in rivers. The Riverscape Analysis Project (RAP), a web-based decision support tool for salmonid conservation will be highlighted and demonstrated. The webinar will also feature the Freshwater Health Index developed by Conservation International. This tool measures the overall condition of freshwater ecosystems at the basin level.

Motivation: This training will focus on a topic that has not been extensively covered by ARSET and has been requested from previous survey data. It will also highlight NASA's Ecological forecasting portfolio and will provide an introduction to a new, NASA applied sciences-funded tool, RAP and the Freshwater Health Index tool

Target Audience: Local, regional, state, federal, and non-governmental organizations involved in conservation, habitat restoration, freshwater health, and riparian landscapes.

Satellites and Sensors: Landsat, MODIS, VIIRS

Website form: <https://forms.gle/L2b3WSuxwGRQLjC57>  
Questions are slightly different

Title: Remote Sensing for Freshwater Habitats

Training Dates and session times: Sept 17, 24, and Oct 1 10-11am ET and 6-7pm ET

Training Type: Online, intro

Why does someone want to take this training? What is new and different about this training? \*

Freshwater habitats play an important role in ecological function and biodiversity. Remote sensing of these ecosystems is primarily tied to observations of the drivers of biodiversity and ecosystem health. Natural resource managers use remote sensing to understand things like land use and land cover change in a watershed, habitat connectivity along a water body, water body location and extent, and water quality parameters. This training will guide participants through an overview of how remote sensing can be used for monitoring these important ecosystems. This is also a topic not extensively covered by ARSET and has been requested from previous survey data. It will also highlight NASA's Ecological forecasting portfolio and will provide an introduction to a new, NASA applied sciences-funded decision support system, The Riverscape Analysis Project and a tool developed by Conservation International (CI), the Freshwater Health Index (FHI).

What problem for the end-user will this training address? (e.g., where to place water quality sensors) Please be as specific as possible. \*

This training will address how to use NASA EO for habitat monitoring, specifically for freshwater fish and other species. Additionally, landscape genetics and the use of remote sensing to assess variability is a burgeoning field, and this webinar will provide participants with a conceptual overview and tools and techniques for applying landscape environmental variables to genetic and habitat diversity in species.

By the end of this training, attendees will be able to: \*

Some info on good verbs to use: <https://tips.uark.edu/using-blooms-taxonomy/>

- Identify which NASA satellites and sensors can be used for freshwater monitoring

- Understand the limitations of remote sensing of freshwater habitats
- Find data and models that can be used in their landscape genetics and habitat monitoring work
- Become aware of case study examples of the use of remote sensing for habitat restoration, ecological assessments, and climate change assessments as they relate to freshwater systems
- Have the ability to use the Riverscape Analysis Project (RAP) decision support system for accessing, downloading, and applying RS data
- Have a familiarity with the Freshwater Health Index to assess the capacity of a waterway to support healthy and economically sustainable populations

### Who is your audience? \*

Explicitly identify your target audience (e.g. Local, regional, state, federal, and international organizations interested in using satellite imagery for coastal and ocean applications)

Local, regional, state, federal, and non-governmental organizations involved in conservation, habitat restoration, freshwater health, and riparian landscapes.

### What prerequisites do attendees need to complete prior to training? \*

Fundamentals of RS

### Image for Promoting the Training \*

Please include a URL or a description of the type of image you would like.

Maybe this one:

<https://www.nasa.gov/sites/default/files/thumbnails/image/padma-resized2.jpg>

### What level is this training? \*

Intermediate (higher level with no exercises)

## Link to the Training Agenda \*

Please include number of materials, guest speakers, topics, tools covered, and attendee learning objectives. Please indicate how much time everything in the training will take as best you can. View an example agenda:

<https://docs.google.com/document/d/1SbtK2WrxqHnE0Mdeh3N5L-oTPbwm-UPyimNUut4JPA/edit?usp=sharing>

### Part 1: Review of Aquatic Remote Sensing and Freshwater Habitats

Materials: 1 presentation

Guest Speakers: None

What will **attendees** be able to do as a result of this session?

- Identify which NASA satellites and sensors can be used for freshwater monitoring
- Understand the limitations of remote sensing of freshwater habitats
- Find data and models that can be used in their landscape genetics and habitat monitoring work

10 min: Satellites and sensors for Aquatic RS

5 min: caveats/limitations of aquatic RS

5 min: Data needs, models, etc.

10 min: Combining multiple data types (in-situ, airborne, satellites)

15 min: Case study examples

- Habitat restoration
- Climate change/land cover change impacts on freshwater habitats

15 min: Question & Answer Session

\*Note, if we need/want to pull from Sherry's 2016 training

- [Session 1](#)
- [Session 2](#)

\*Also take a look at Amita's water trainings too

### Part 2: Overview of the Riverscape Analysis Project (RAP)

Materials: 1 presentation

Guest Speakers: Potentially Brian Han, from U of Montana (works on project), but likely just Amber

What will **attendees** be able to do as a result of this session?

- Become aware of case study examples of the use of remote sensing for habitat restoration, ecological assessments, and climate change assessments as they relate to freshwater systems
- Have the ability to use the Riverscape Analysis Project (RAP) decision support system for accessing, downloading, and applying RS data

15 min: Overview of RAP

15 min: Data access and analysis with RAP

15 min: [RAP Demo](#)

15 min: [Question & Answer Session](#)

Part 3: [Overview of the Freshwater Health Index](#)

Materials: [1 presentation](#)

Guest Speakers: [Potentially John Bolten, from Goddard or Derek fulmer \(CI\), but likely just Amber](#)

What will **attendees** be able to do as a result of this session?

- [Understand how to evaluate freshwater ecosystem health](#)
- [Have the ability to use the Freshwater Health Index data and tools for assessing freshwater ecosystem health](#)
- [Identify potential uses of the FHI for their work and decision-making](#)
- [Use the FHI to identify vulnerabilities to degradation and/or climate change and opportunities for improvement or infrastructure development within a basin](#)

15 min: [Overview of freshwater ecosystem health metrics](#)

15 min: [Overview of the FHI](#)

15 min: [FHI Demo](#)

15 min: [Question & Answer Session](#)

Do you anticipate having guest speakers? \*

If you are having guest speakers and they are not confirmed, PLEASE confirm your guest speakers before filling out this form.

[Potential for guest speaker Brian Han \(UM\) for RAP \(session 2\) and/or John Bolten \(Goddard\) or Derek fulmer \(CI\). Will let you know asap.](#)

Instruments/Missions Covered \*

[Landsat, MODIS, VIIRS](#)

What products and tools would you like included on the training survey? \*

[FHI, RAP](#)