Monitoring Water Quality for Aquaculture using NASA Remote Sensing Observations

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Outline

- Introduction
- About the Applied Remote Sensing Training (ARSET) program
- Workshop objectives and agenda

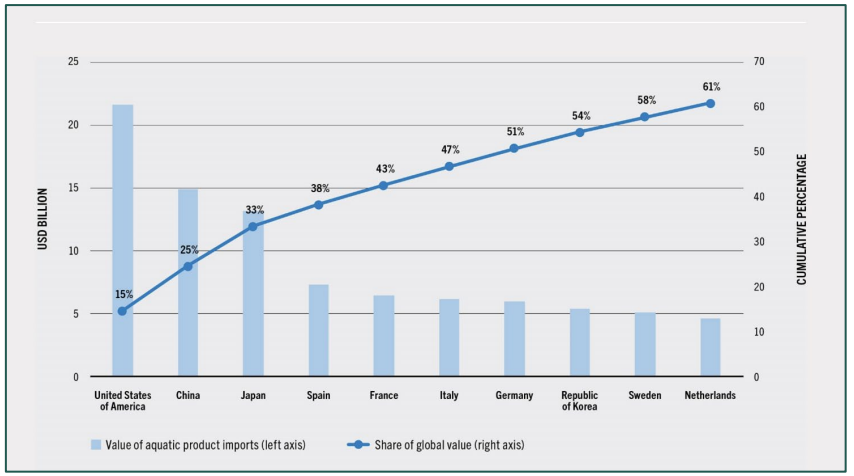
Impact of Aquaculture

- Improve food security and nutrition for humans
- Boosts economic growth
- Can help keep waterways clean

In the US:

- 5961 aquaculture farms
- About 1500 aquatic species
- 22000 jobs in aquaculture activities
- Economic Impact $4,000,000,000
- Value of Seafood Imports $29,682,165,000

TOP TEN IMPORTING COUNTRIES OF AQUATIC PRODUCTS, 2020



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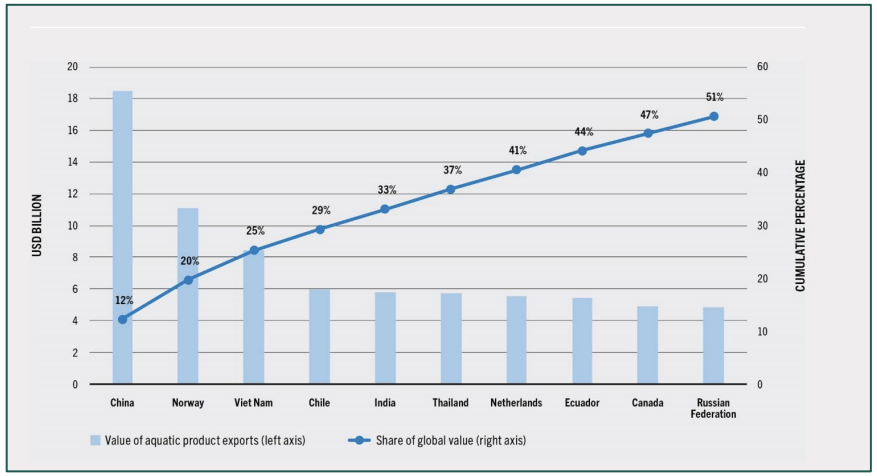


NOAA Fisheries
National Aquaculture Association

Food and Agriculture Association

Harmful Algal Bloom Impact on Aquaculture

Harmful Algal Bloom (HAB) in waters:

- Produce toxins
- Reduce dissolved oxygen
- Contaminate or kill fish & shellfish – directly by toxins or clogging gills

HAB events and aquaculture:

- Contaminated fish consumption can affect human health
- Result in delay or closure of harvest
- Supply and demand chain disruption & food insecurity
- Prevent the growing of new cohorts
- Cause economic losses of millions of dollars

NOAA Fisheries

NOAA Ocean Service

Monitoring water quality and HAB benefit aquaculture productivity and management

Applied Remote Sensing Training (ARSET) Program

About ARSET

- **ARSET provides accessible, relevant, and cost-free training on remote sensing satellites, sensors, methods, and tools.**

- Trainings include a variety of applications of satellite data and are tailored to audiences with a variety of experience levels.

AGRICULTURE

DISASTERS

ECOLOGICAL CONSERVATION

HEALTH & AIR QUALITY

WATER RESOURCES

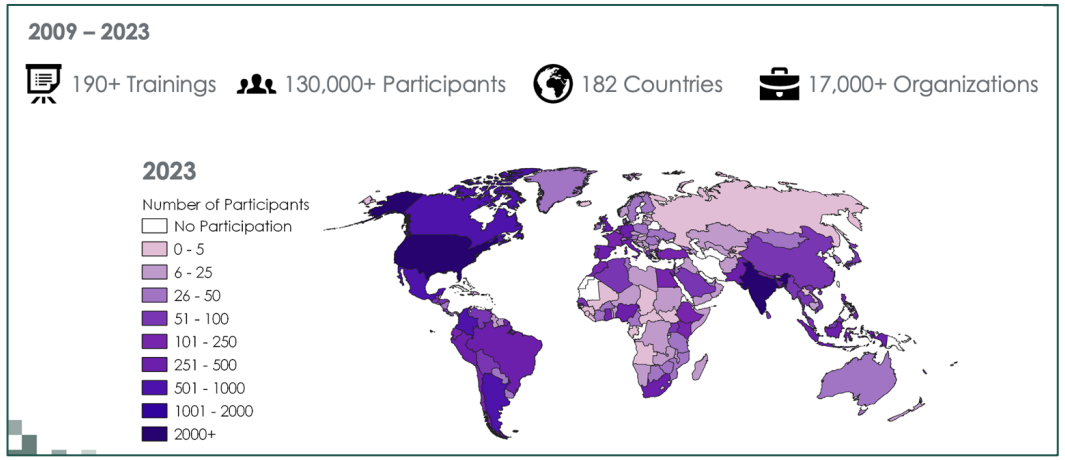
WILDLAND FIRES

About ARSET Trainings

- Online or in-person
- Live and instructor-led or asynchronous and self-paced
- Cost-free
- Bilingual and multilingual options
- Only use open-source software and data
- Accommodate differing levels of expertise

- Visit the ARSET website to learn more.

ARSET Trainings Reach a Global Audience



Workshop Objectives and Agenda

Learning Objectives

By the end of this workshop attendees will be able to:

- Recognize how remote sensing data can be used to estimate water quality parameters.
- Identify relevant NASA missions and data products for detecting harmful algal blooms (HABs) via chlorophyll-a and water temperature, total suspended solids (TSS), water transparency, and salinity in coastal zones and inland lakes.
- Identify interactive web tools for historical and near-real time analysis and visualization of HAB indicators, TSS, and water transparency.
- Use the web tools for assessing water quality parameters in coastal zones and inland lakes to facilitate aquaculture management.

Workshop Agenda

Part 1: Presentations [9:30 to 11:00 AM]

- Introduction to NASA Water Resources Program
- Introduction to Earth Observations for Monitoring Water Quality
  - Fundamentals of Remote Sensing
  - Satellite missions
  - Data products
- **Demonstration**: data access, analysis, and visualization web tools: Worldview
- Overview of Satellite-based Tool for Rapid Evaluation of Aquatic EnvironMents (STREAM)
- **Demonstration**: data access, analysis, and visualization web tools: STREAM

Break [11:00 to 11:15 AM]

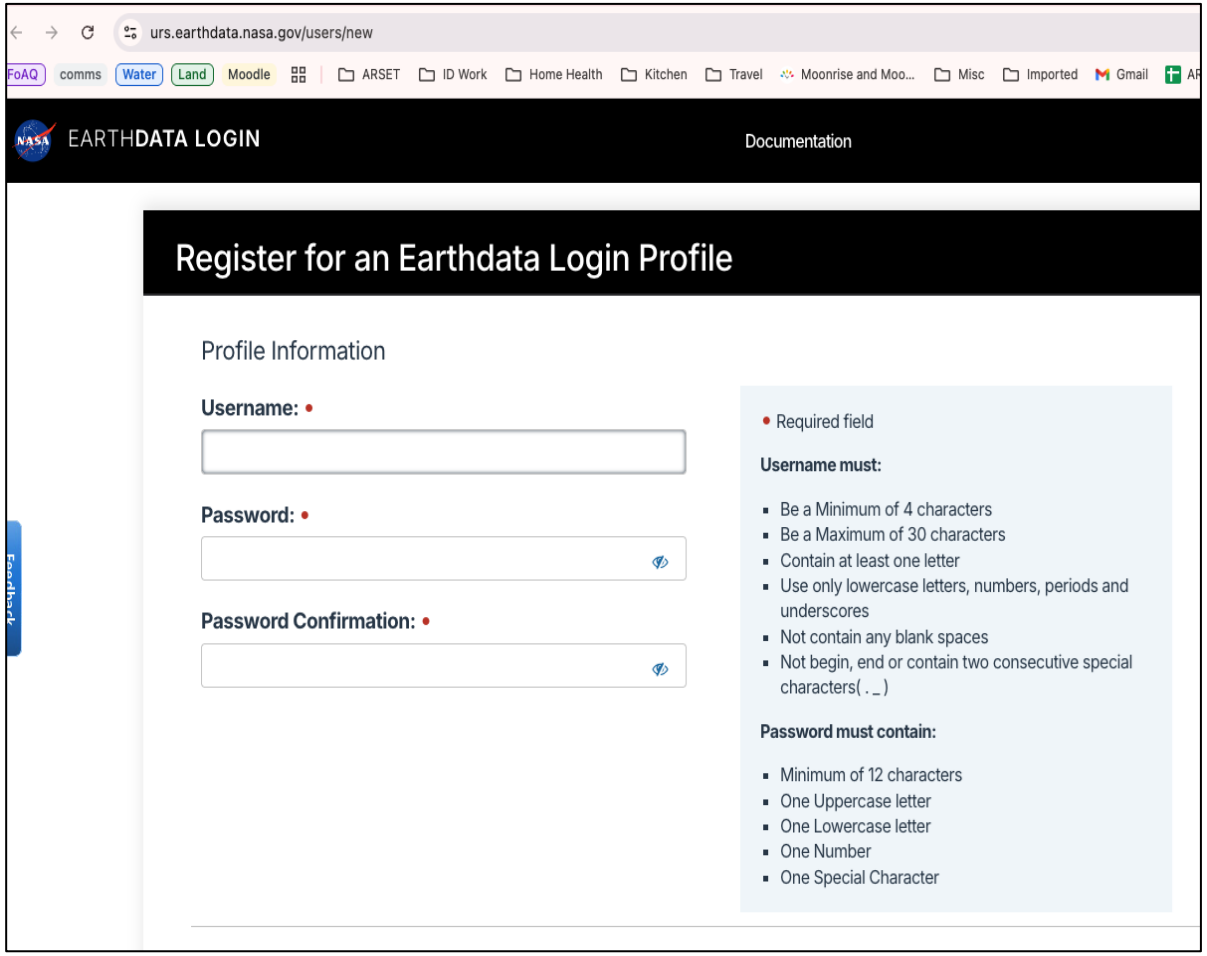
Part 2: Hands-on Exercises [11:15 AM to 12:15 PM]

- Monitoring coastal and inland WQ parameters for facilitating aquaculture applications using Worldview and STREAM

Summary and Survey [12:15 to 12:30 PM]

Registration to NASA Earthdata

- NASA earth observation data products are open source.
- The data are available from Earthdata Search and distributed active archive centers (DAACs).
- Registration for NASA Earthdata is required to access data products.



Introduction to NASA Water Resources Program

Kelly Luis