

Using Technology to Bring a Hidden Migration to Life:

Crowd Sourcing the Counting of Upstream Migration Video

Andy Hrycyna

Mystic River Watershed Association

River Herring Network Annual Meeting

November 2, 2017

Mystic River Watershed



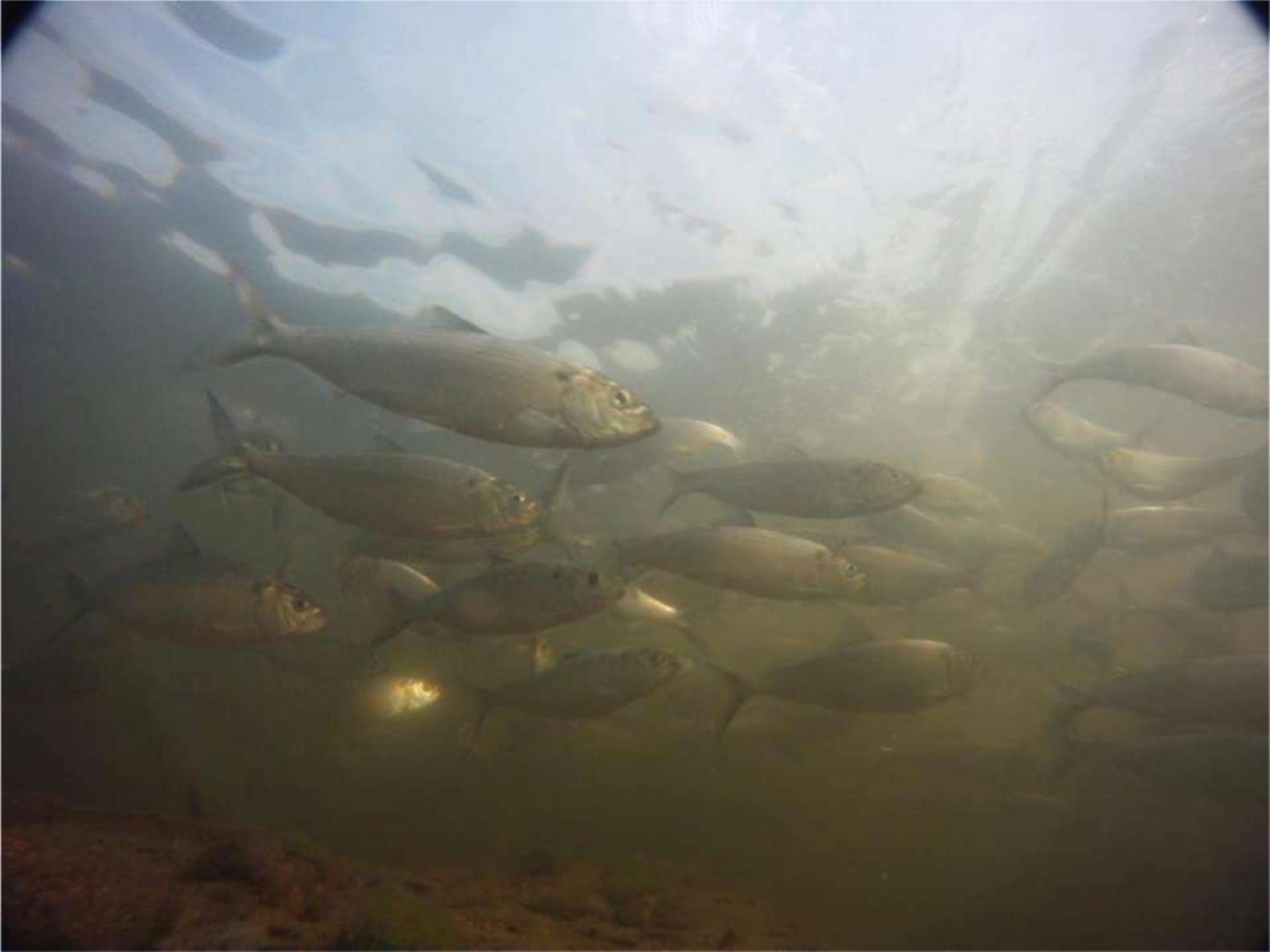
- 76 square miles
- 450,000+ people
- 1% of the land area of Massachusetts, 7% of the total population



Data: MassGIS



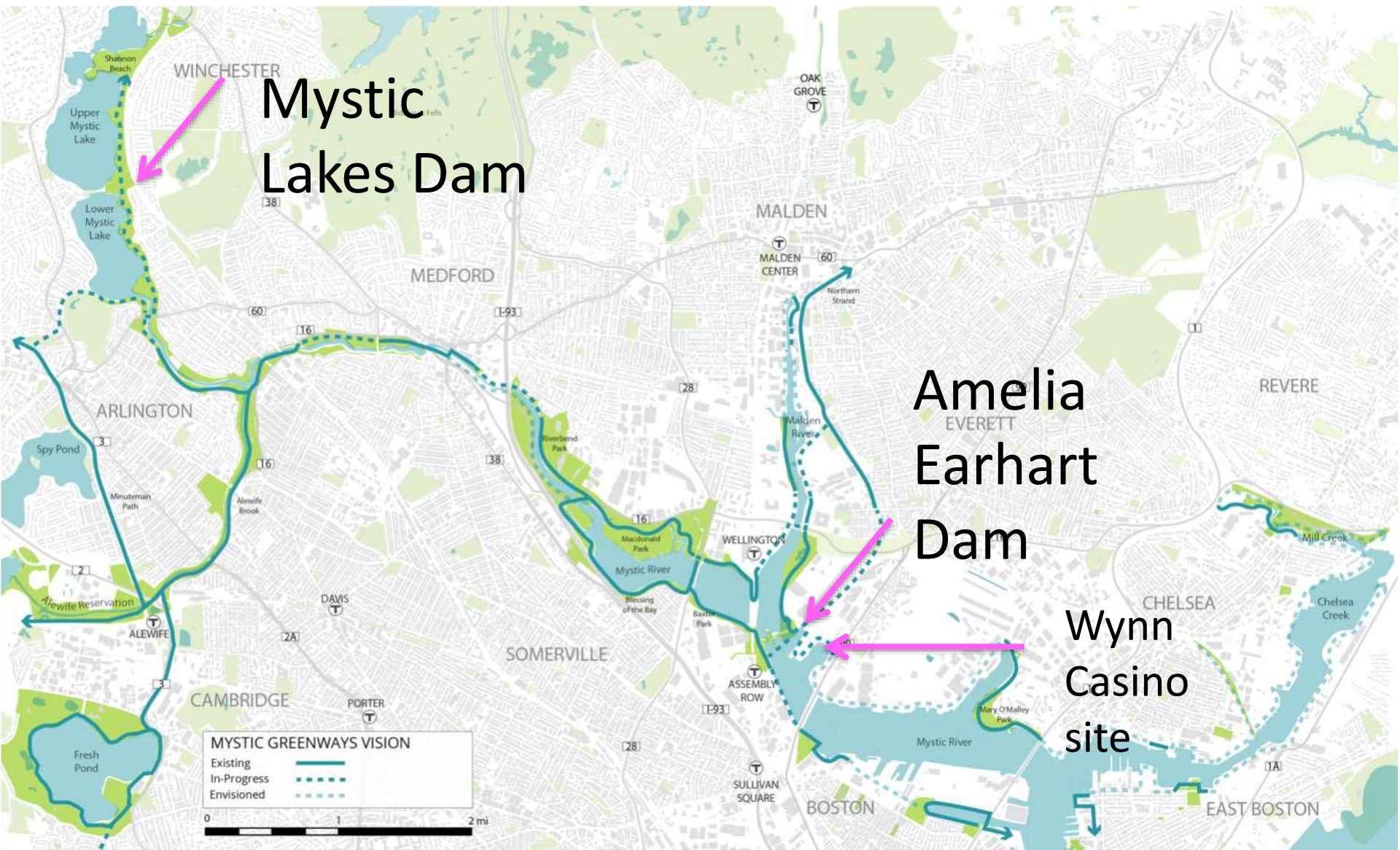




Mystic Lakes Dam

Amelia Earhart Dam

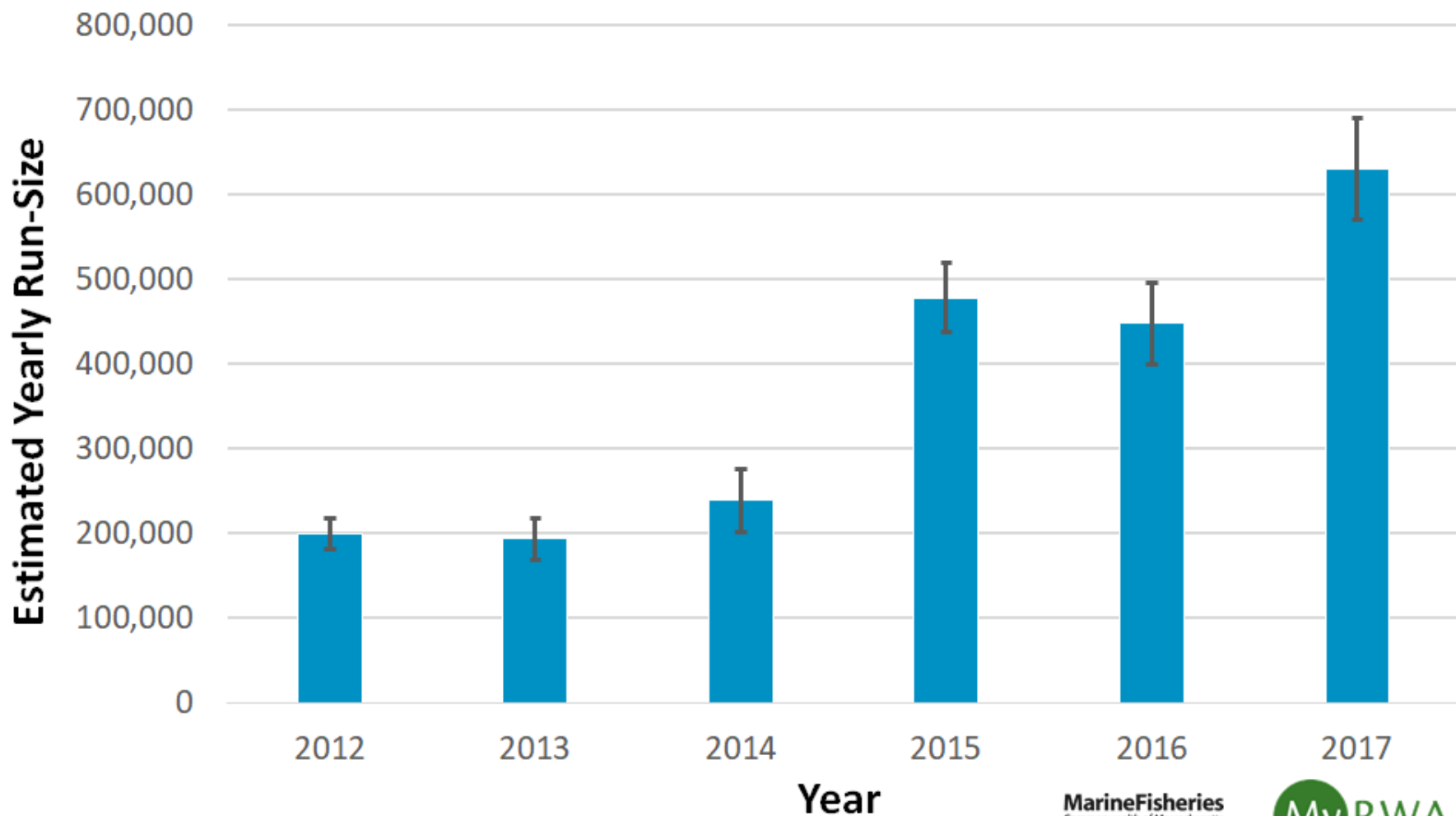
Wynn Casino site





Estimated Yearly Herring Run Size

Mystic Lakes, Medford, MA



Marine Fisheries
Commonwealth of Massachusetts



MyRWA
Mystic River Watershed Association
your community • your watershed

Project Partners



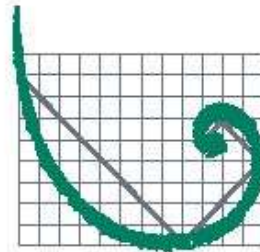
dcr
Massachusetts



Marine Fisheries
Commonwealth of Massachusetts



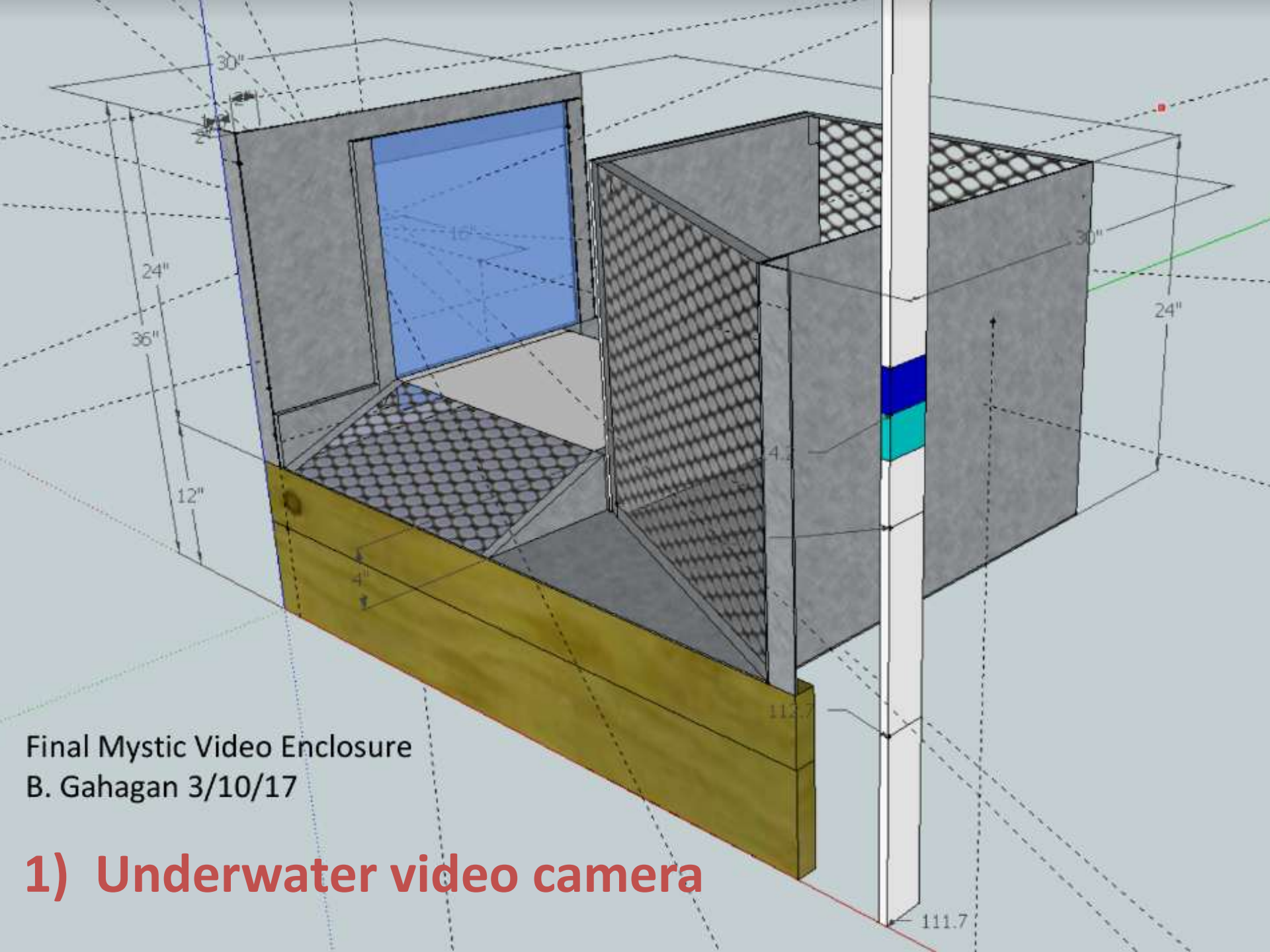
The Boston
Foundation **tBf**



ERM

Drane Family Fund





Final Mystic Video Enclosure
B. Gahagan 3/10/17

1) Underwater video camera



**Fish Passage
Box**

Laptop box

Camera box

Fish Passage

Passage Narrower

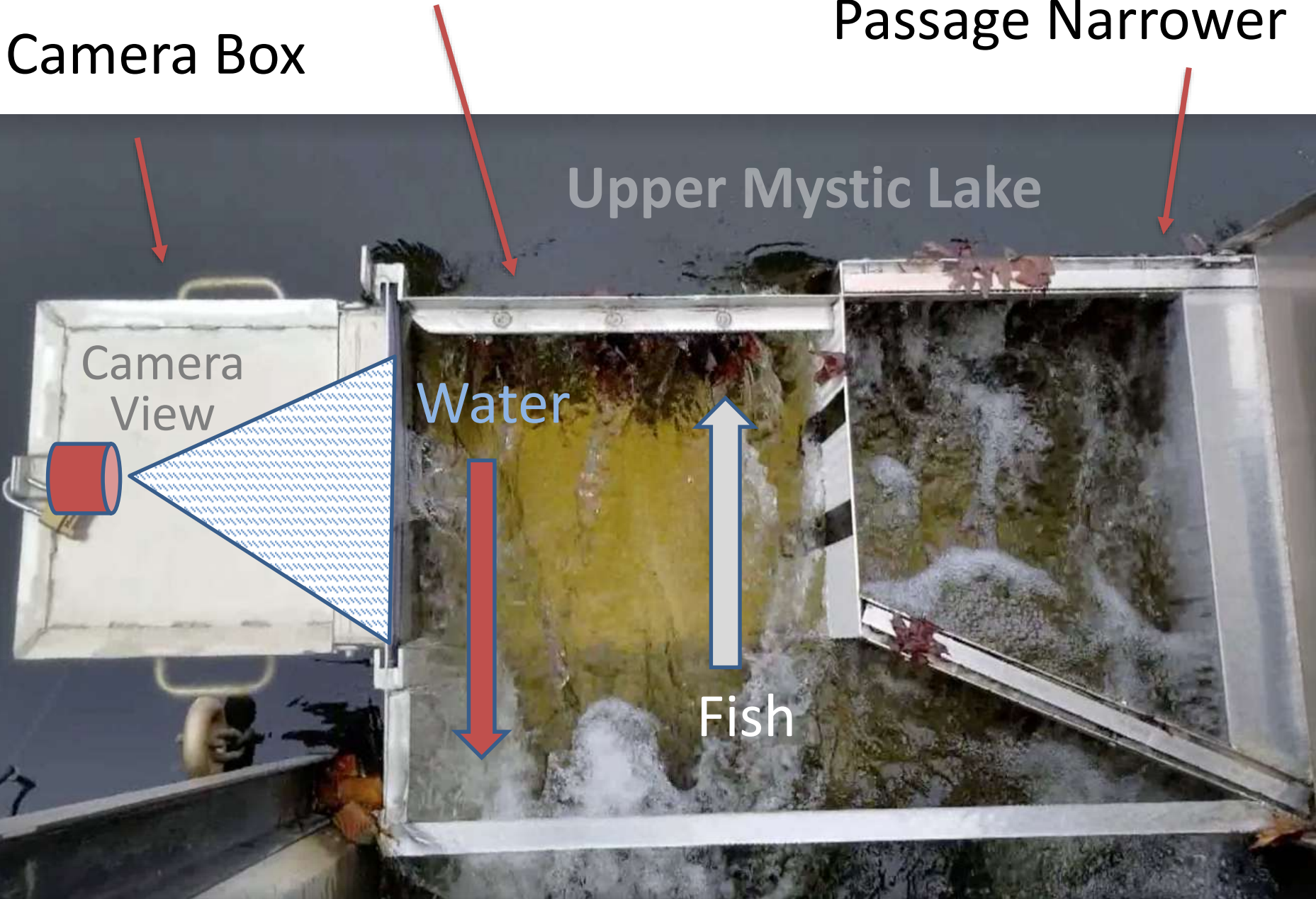
Camera Box

Upper Mystic Lake

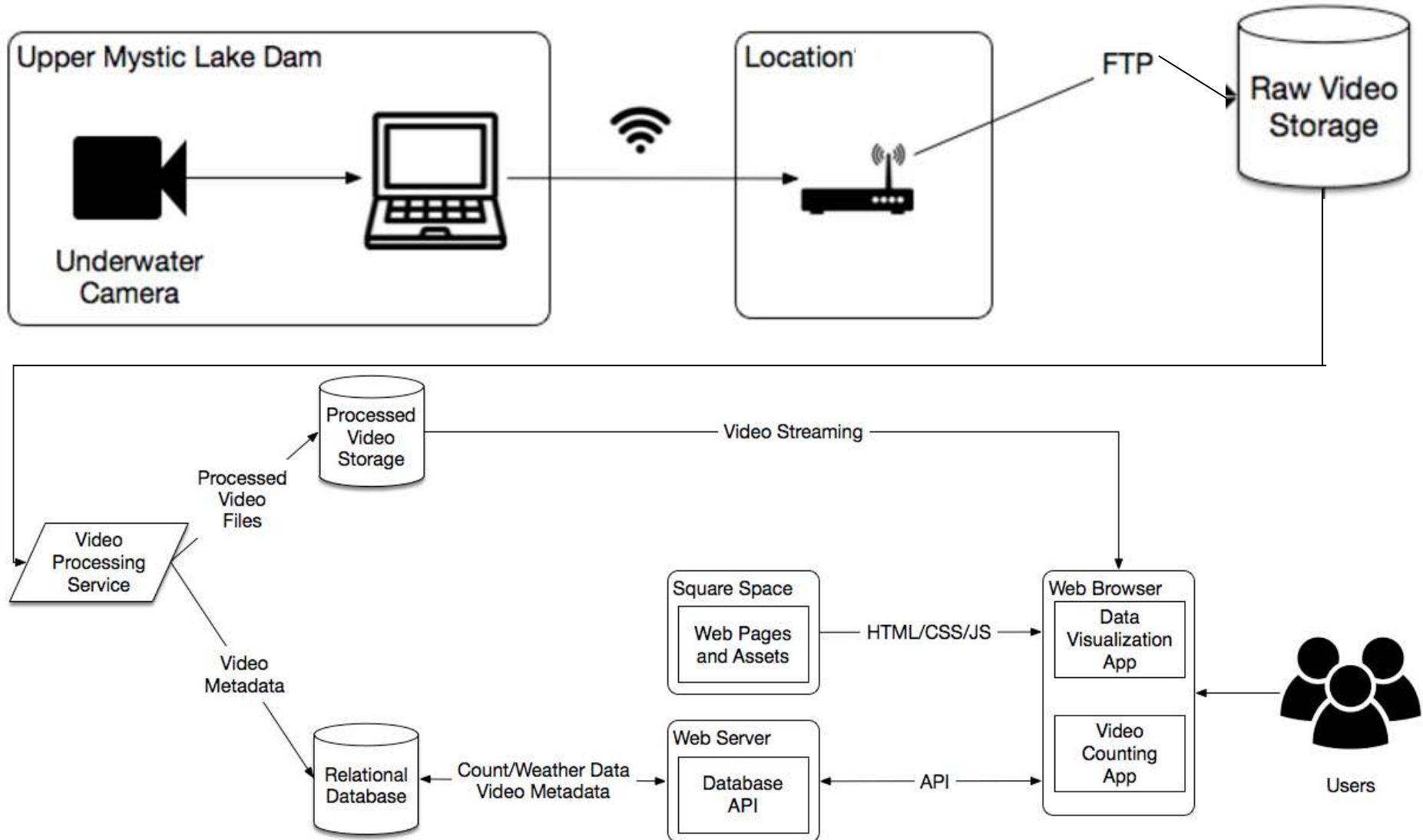
Camera View

Water

Fish



System Architecture



Web Interface

www.MysticHerring.org

MYSTIC RIVER HERRING

HOME

ABOUT

EXPLORE THE DATA

TEACHER RESOURCES

COUNT FISH

GOT A MINUTE?

Help us monitor the Mystic River Herring Migration!

Watch a short video and tell us how many fish you see. Together, we can collect valuable data about this important species.

START COUNTING!

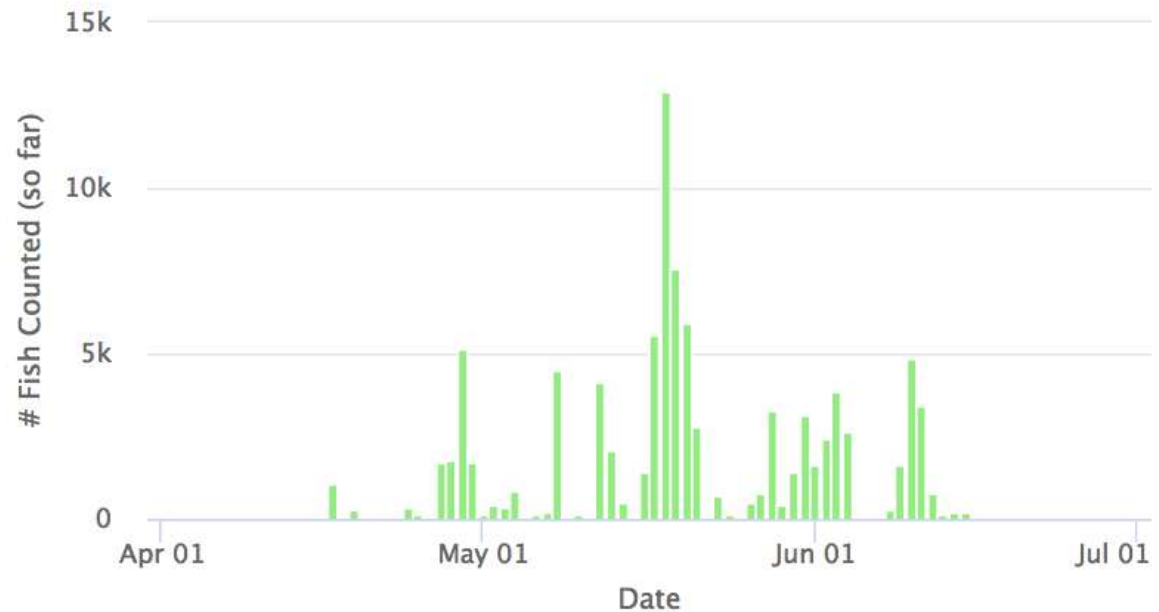


Number of Fish Counted

Each bar shows how many fish were migrating each day based on the current video counts. These totals will increase as more videos are watched. Once all of the videos have been watched, we will know exactly how many fish were migrating each day.

94,914

Total Fish Counted



Number of Videos Counted

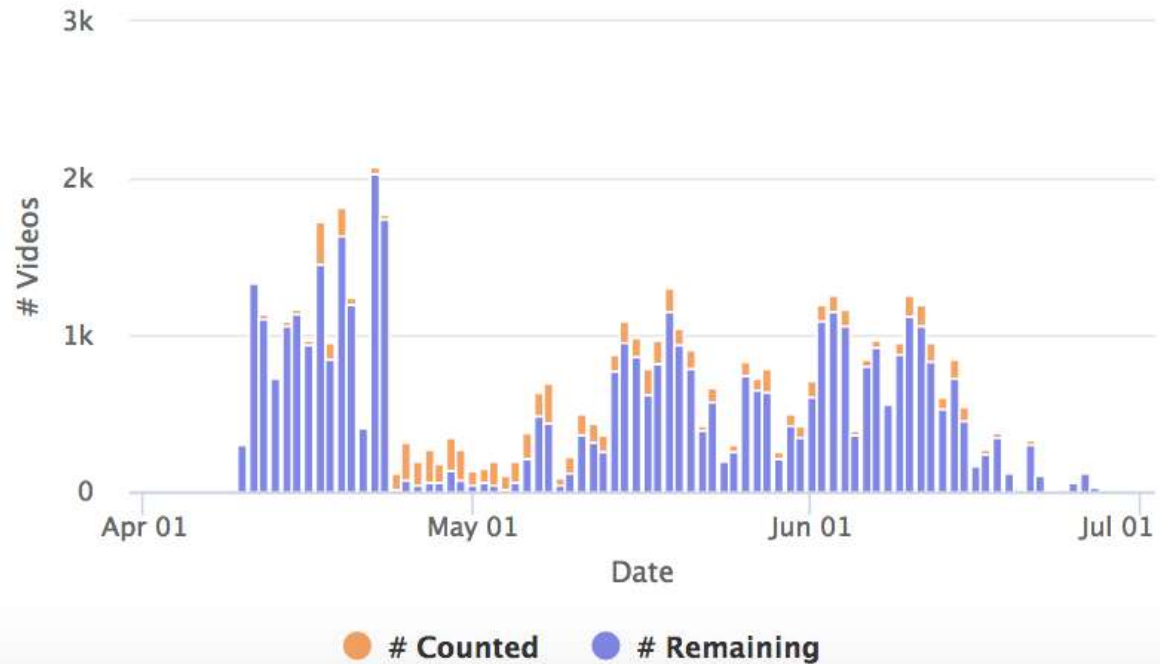
Each bar shows how many videos were recorded each day, plus how many of those have been counted and how many remain to be counted. The number of recorded videos depends on how active the fish were on that day, but also whether the camera was properly configured to only record when it detected fish and not other things floating by.

6,926

Total Videos
Counted

43,918

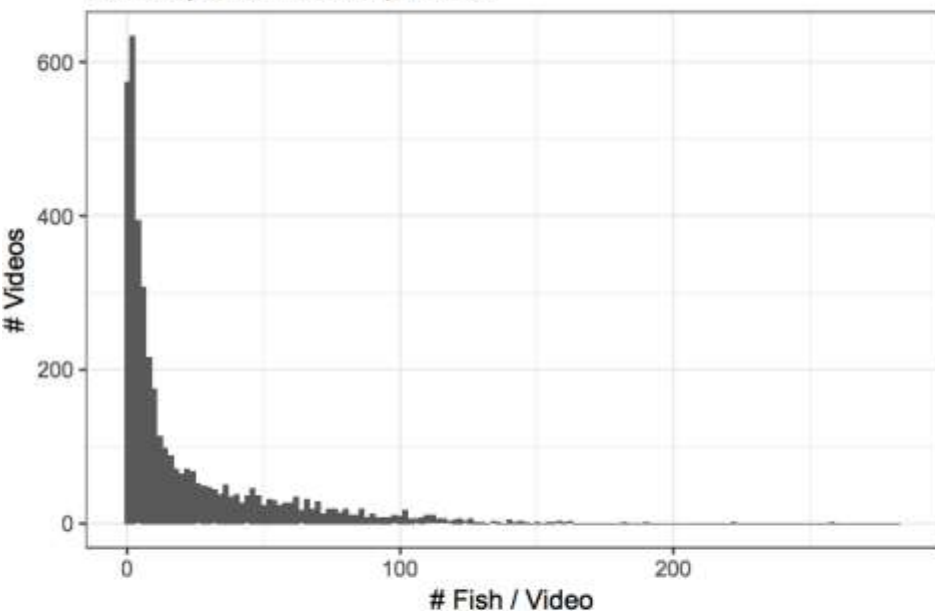
Total Videos
Remaining



Histograms

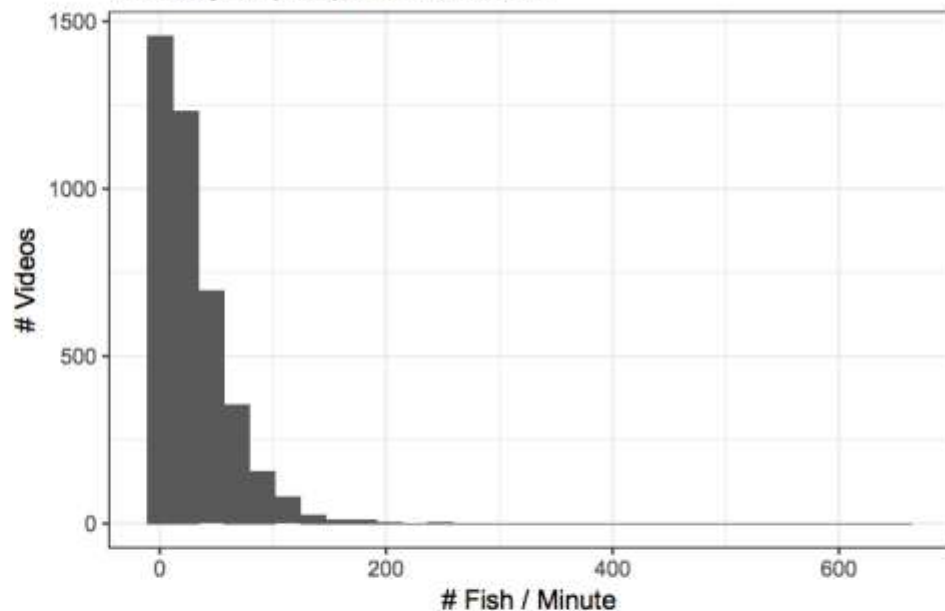
Fish per Video (excluding 0 counts)

How many fish are counted per video?



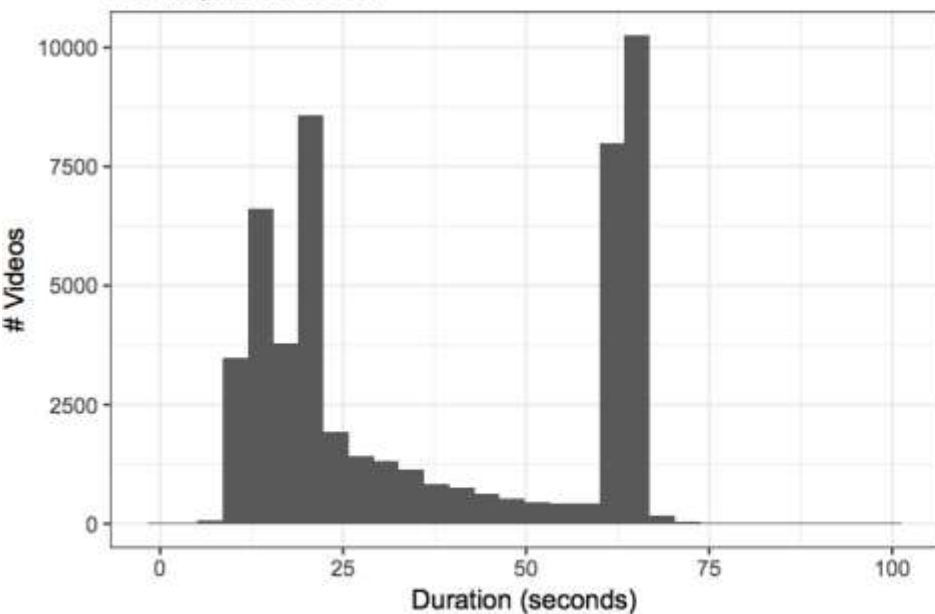
Fish per Video Minute (excluding 0 counts)

How many fish pass per minute of video?



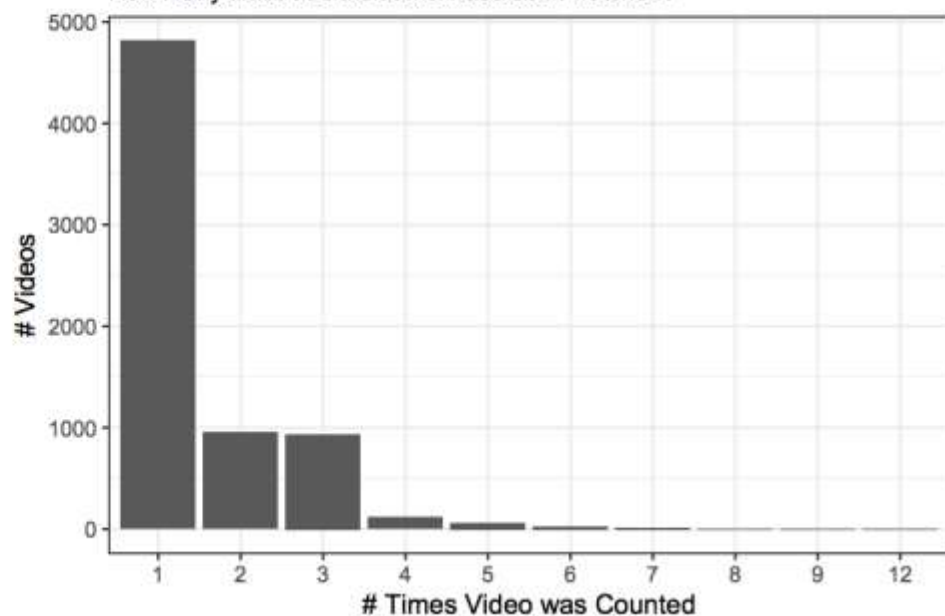
Video Duration

How long are the videos?



Counts per Video

How many times has the same video been watched?



Outreach metrics

- 5900 sessions
- 3335 users
- 19,837 page views
- 3:18 = average session length
- 96% of users from US from nearly every state
- 17 countries (not including bots?)
- 326 hours of viewing (vs. 150 hours visual count)

Education



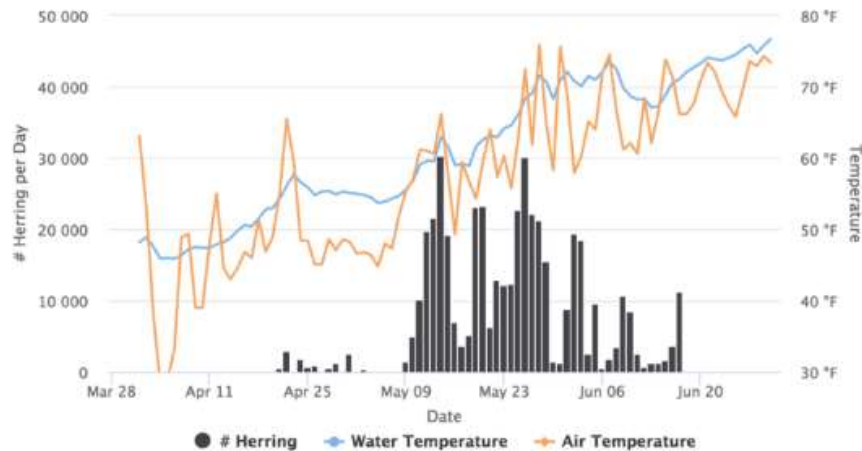
1. East Boston
2. Medford
3. Melrose
4. Somerville
5. Wakefield
6. Winchester

30 teachers engaged from 6 school districts

440 students involved in 2017

Explore the Data

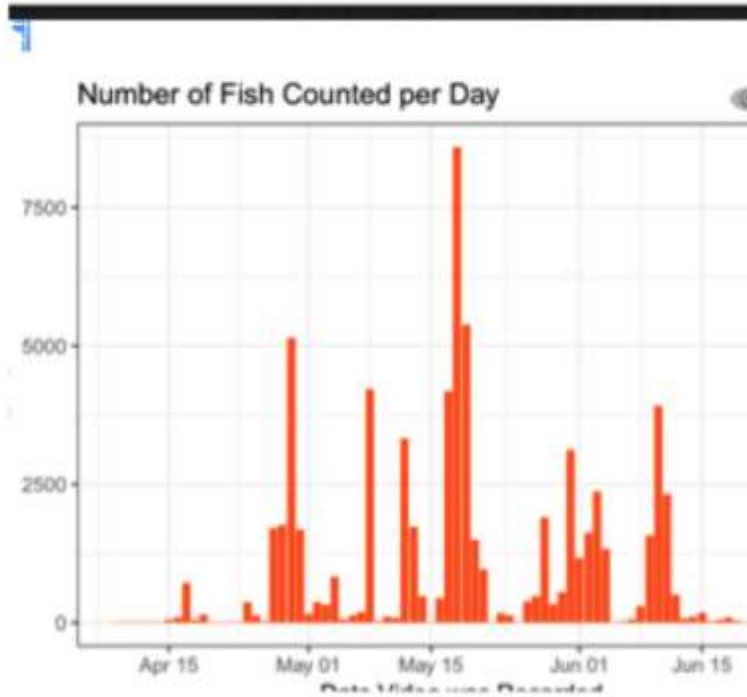
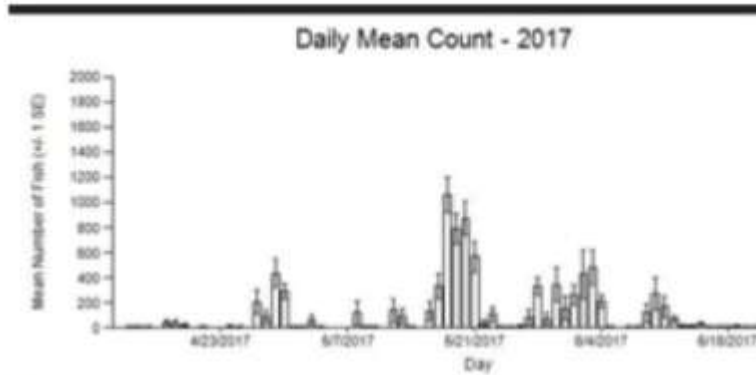
WHAT CAUSES THE RIVER HERRING TO START MIGRATING EACH YEAR?



Each spring, river herring begin their migration up the Mystic River. But what causes them to start migrating? Why do they start earlier or later in some years relative to others?

[EXPLORE THIS STORY](#)

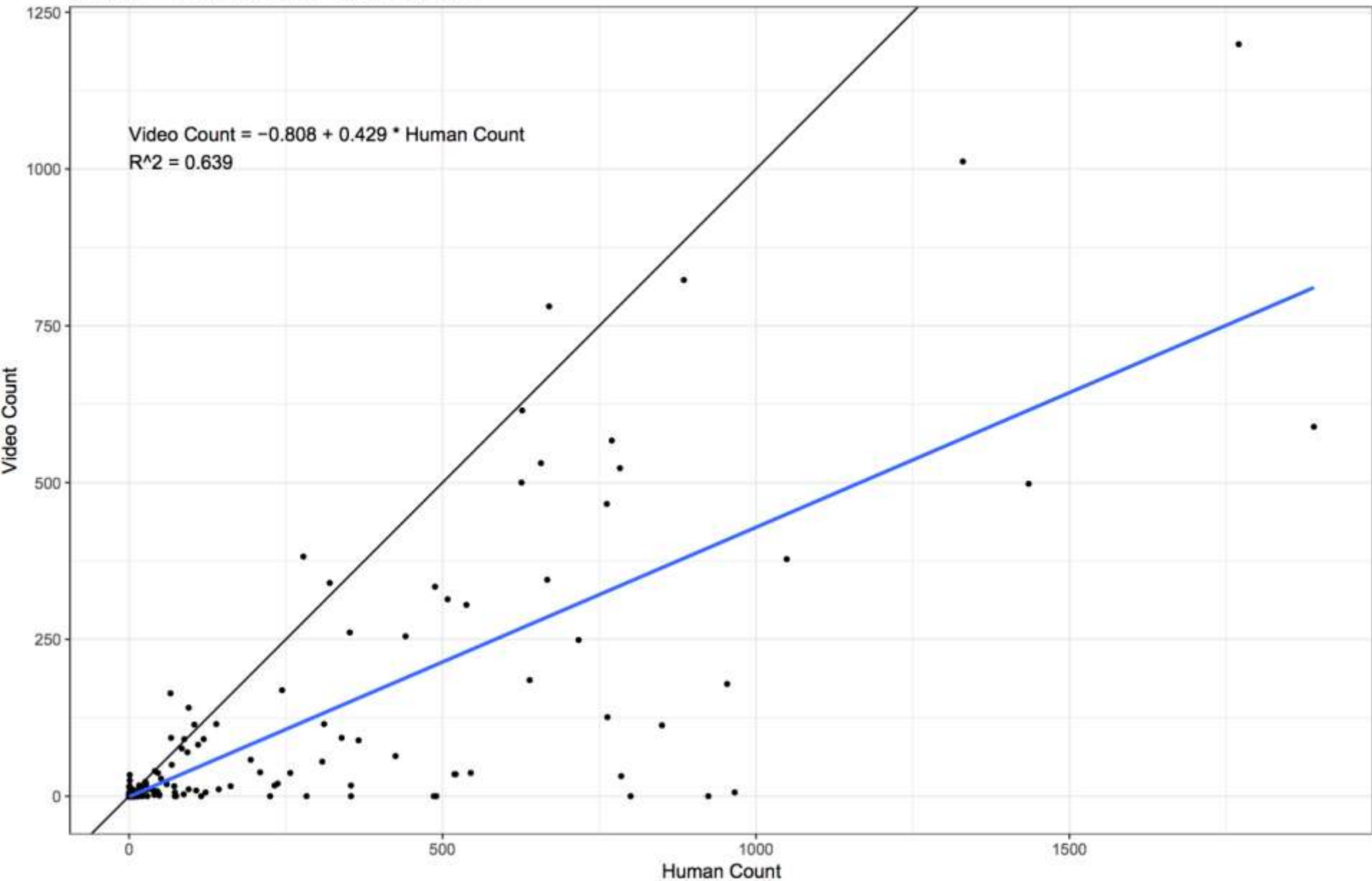
Science



Human (in-person volunteer) vs. Video Counts

Only includes video counts if all videos during 10-minute period have been counted

Black Line = 1:1 Line, Blue Line = Linear Regression





'Deis does Citizen Science

A VIRTUAL HERRING COUNT DATA SPRINT
TO SUPPORT THE MYSTIC RIVER WATERSHED ASSOCIATION

10 AM - **NOV. 7** - 1 PM

FABER LIBRARY MEZZANINE

10 AM DISCOVER HERRING:
LEARN ABOUT THE ECOLOGY, MIGRATION,
& POPULATION STATUS IN THE MYSTIC RIVER

11 - 1 PM DATA SPRINT:
HELP MYWRA UNDERSTAND MIGRATION PATTERNS
IN THIS URBAN WATERSHED BY COUNTING HERRING
VIRTUALLY. DROP IN ANYTIME! BRING A LAPTOP!



Questions?

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