Citizen Research on American Eels:
catching inspiration from tiny slimy creatures

NYSDEC Hudson River Estuary Program,
National Estuarine Research Reserve,
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Hudson River Estuary

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glass eels

Summary

- American eels are fascinating animals that migrate between oceans and streams
- Students and other citizens can study the springtime migration of juvenile “glass eels” into their local waterways
- This study is useful to scientists, environmental managers, educators, and the community

American Eel (*Anguilla rostrata*)

- Catadromous life cycle
- Widespread in East and Gulf Coast rivers
- Slow to mature (10+ years)
- Commercially harvested in some states
- Declines noted in both American and European species

Study design and materials

Eel and Herring Research Project at Fall Kill, Poughkeepsie

Date:_____ Time of Sampling:_____ Time of Low Tide (from table):_____

Names of Samplers:_____School/Group:_____

ENVIRONMENTAL DATA

Air Temp:_____°F _____°C Water Temp:_____°F _____°C

Stream Flow Direction (circle one): upstream downstream slack

Tide Period in Hudson River (refer to table and circle one): high low ebb flood

Cloud Cover (check one)
- ☐ Clear (0-10%)
- ☐ Partly cloudy (10-50%)
- ☐ Partly to mostly cloudy (50-90%)
- ☐ Overcast (>90%)
- ☐ Foggy
- ☐ Hazy

Precipitation (check one)
- ☐ None
- ☐ Drizzle
- ☐ Light Rain
- ☐ Heavy Rain
- ☐ Squally (rainy with gusts of wind)
- ☐ Snow or Sleet

GLASS EELS

Glass eels refers only to those small eels that are partly transparent. You may also catch small brown or yellow eels that have been in the stream for a year or two. Remember to close the net when done!

Number of glass eels caught:_____ Number weighed:_____ Total Weight:_____grams

Other animals caught in the net, including small yellow and brown eels (record number and species):

HERRING

Choose a spot not interrupted by the eel net and watch for herring for 15 minutes. Polarized glasses will help. Herring are usually about a foot long, are swimming upstream, and have a blue/gray color.

Start Time:_____ End Time:_____

First observer, number of herring:_____ Second observer, number of herring:_____

OTHER NOTES AND OBSERVATIONS including fishermen, animals, and things you see:

Contacts:Chris Bowser (NYSDEC Estuary Program):cell (845)264-5041; Lisa DiMarzo (Mid Hudson Children's Museum):(845)471-0589
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION HUDSON RIVER ESTUARY PROGRAM

Straightforward methodology consistent across sites:

Catch in fyke nets placed at trib mouths; Count, weigh, and release upstream;
Record environmental conditions; March through May season

Similar methods, varied participants

Saw Kill: college and faculty

Crum Elbow: alternative high school

Fall Kill: high school students, interns

Indian Brook: nature center, visitors

Furnace Brook: high school students

Minisceongo Creek: watershed citizens group


Furnace Brook

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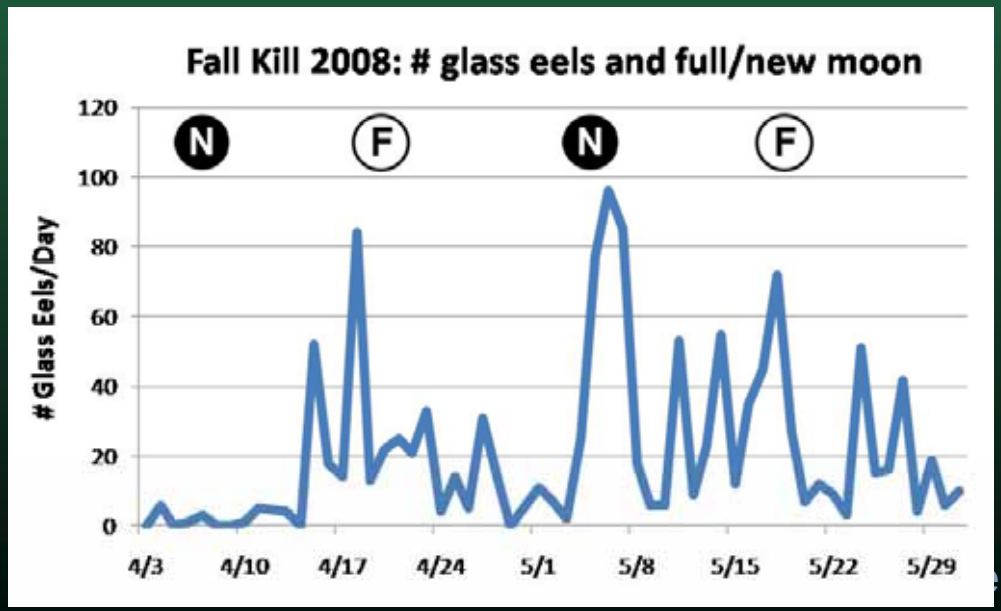
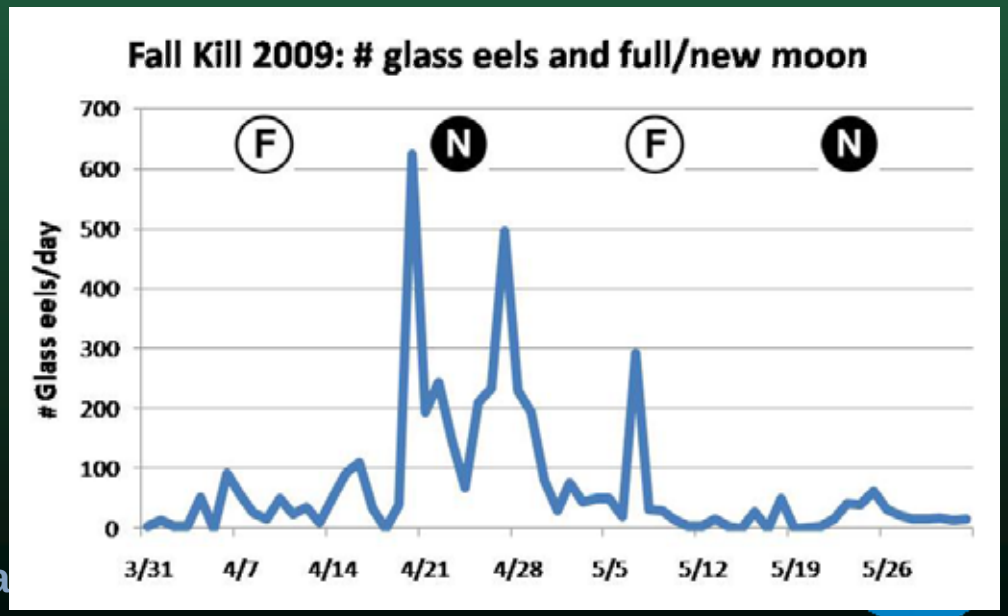
Examples of Results from 2008 & 2009

- Glass eel CPUE is higher in downriver sites
- 2009 migration was stronger than 2008 at our study sites.
- Some correlation with lunar phase and high water level

Tributary	Glass Eel #		CPUE	
	2008	2009	2008	2009
Fall Kill Creek (RM 76)	1228	3157	21.9	50.9
Furnace Brook (RM 39)	1131	3446	36.5	57.4





Science

- Understanding migration is a key step in managing fish and restoring habitat
- Longer multi-year data sets are very important
- This project is part of larger focus on eel habitat and stream access

Community

- Public outreach and presentations
- Family and friends
- Research close to home

Extension topics

- Student research often incorporated into class projects and science competitions
- Hands-on methods and scientific relevance is attractive to watershed groups and volunteers
- Several sites also involved with autumn mitten crab surveys

Post Project Evaluations from 2009

(numbers are averages for approx. 30 evaluations)

"Please rate your **knowledge** of your local stream environment before and after this project"

Before: 2.2 **After: 3.8**

"Please rate your **attitude** of your local stream environment before and after this project"

not valuable,
no need to protect

valuable,
need to protect

Before: 3.8

After: 4.7

What did you like most about the project?

"I enjoyed the nasty slimeness of the eels and getting dirty."

"Working with both college and highschool students."

"I liked getting to count the eels, and feel them moving around in my hand."

Challenges and Opportunities

Of Citizen Science

• Generating volunteer interest despite few finds	• Couple low return project with high return project
• Questionable data quality	• Collect simple parameters (ID, size, sex)
• Volunteers inexperienced at larval species identification	• Study charismatic species at life stages that are easy to identify
• Use of untested or undependable methods	• Built-in lessons on troubleshooting and scientific uncertainty
• Volunteers want **worthwhile** research experience	• Connect research to the “big picture” and allow volunteer input

Further reading

•Schweid, Richard. *Consider the Eel.* 2002. University of North Carolina Press, Chapel Hill, NC.

•Schmidt, R., Lake, T., and R. Peterson. Hudson River tributaries in the lives of fishes with emphasis on the American eel. 2006. *In* American Fisheries Society Symposium 51:317-330.

Acknowledgments

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•New York State Water Resources Institute of Cornell University

•Catherine O'Reilly (Bard College)

•Encyclopedia of Life, Harvard University

•National Audubon, TogetherGreen, and the Hudson River Valley Greenway

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- Hudson River Valley Greenway
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- Ossining High School
- Keep Rockland Beautiful and Strawtown Studios
- Dutchess BOCES Environmental Academy
- Mirant Bowline
- Audubon at Constitution Marsh
- Hudson River Sloop Clearwater

Thank you

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