Acoustic Telemetry in the Great Lakes

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QFC

GLATOS
Great Lakes Acoustic Telemetry Observation System

MICHIGAN STATE UNIVERSITY

great lakes observing system

Protecting Our Fishery
Great Lakes Fishery Commission
SCIENCE • SEA LAMPREY CONTROL • PARTNERSHIPS

USGS
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- What is acoustic telemetry?

- What is GLATOS?

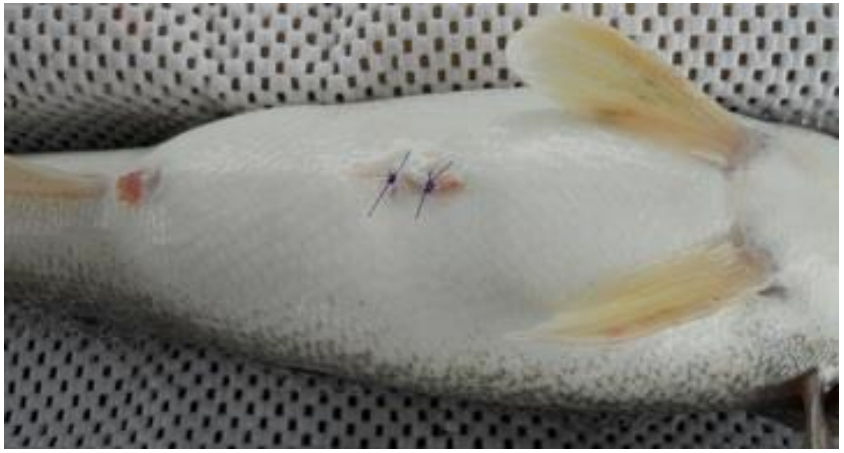
GLATOS
Great Lakes Acoustic Telemetry Observation System

- What am I working on?

- Musings on the future…

Acoustic Telemetry: Tags and Receivers

Acoustic Telemetry: Tags and Receivers

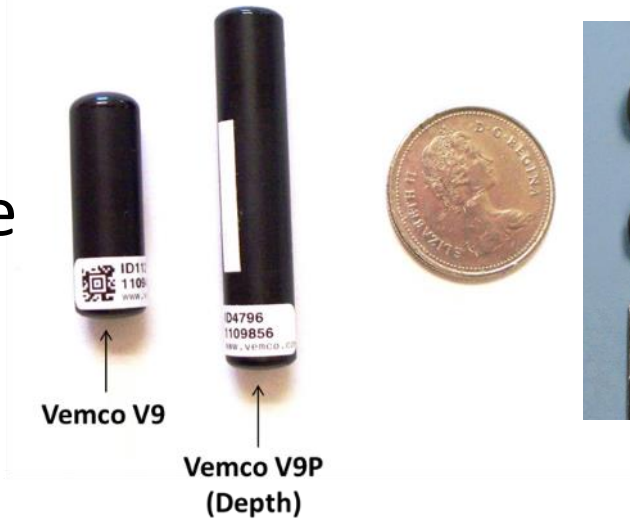


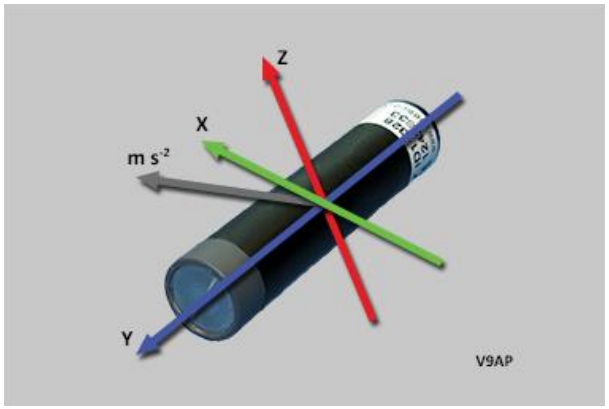
Acoustic Telemetry: Tags and Receivers

Acoustic Telemetry: Tags and Receivers

The Tags

- Wide range of options depending on your study objectives
- Sizes, ranges, battery life
- Additional sensors





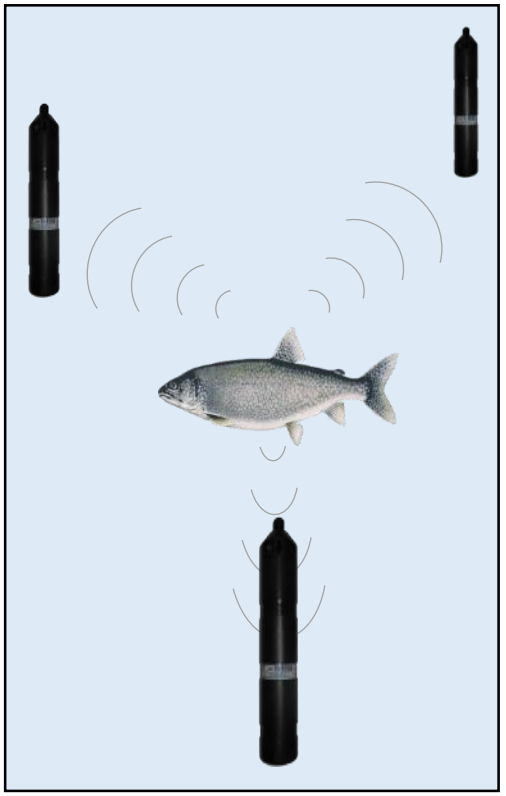
The Receivers

Receivers typically are:

- Stationary and fixed
- Not real time

Optional:

- Active tracking
- Real time



Big part of study design needs to be the receiver distribution

ID 320698
2013-07-04

Slide by Chuck Krueger

The History of

History – How did GLATOS start?

❖ **Origin**

Great Lakes Restoration Initiative – U.S.
Administered by U.S.EPA

❖**Great Lakes Fishery Commission (GLFC) Acoustic Telemetry Projects Established**

- **Funding over 7 years; 2010 - 2016**

❖ **Established sea lamprey, walleye, lake trout projects in 2010, and then a 4th lake sturgeon in 2011 with help from GLFT**

Slide by Chuck Krueger

History – What obstacles did we face?

Immediate Challenges

- **Receivers – must share locations and operational schedules**
- **Data sharing – must be able to share tag detection data**
- **Tag returns – must facilitate tag returns from fishery.**
- **Communication – critical among PIs and with public**

Slide by Chuck Krueger

History – What is the focus of GLATOS?

- **Creation of GLATOS**

Mission Statement

… is a **network** of researchers conducting acoustic telemetry projects on fish movement in the Great Lakes.

GLATOS provides researchers with opportunities to

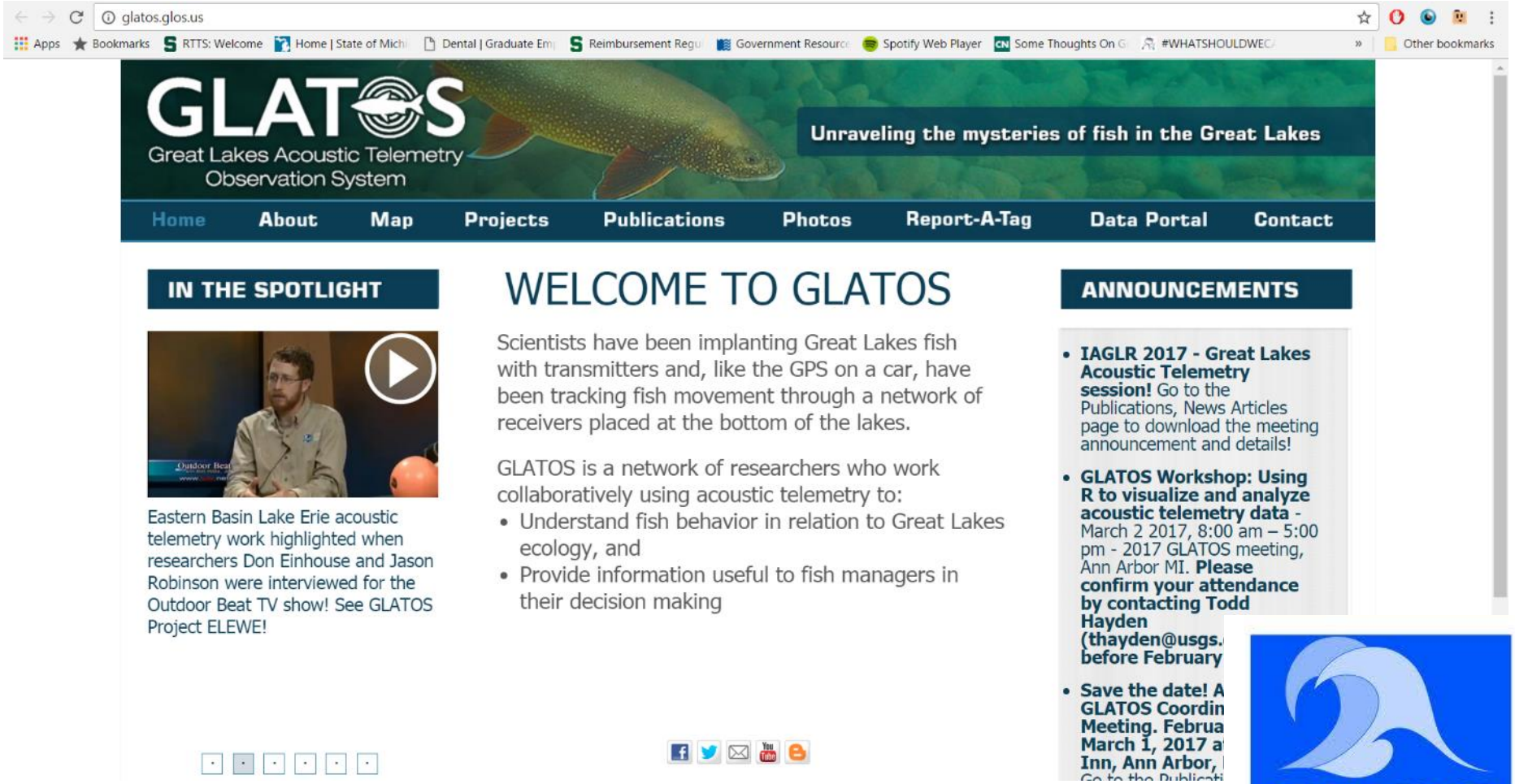
- develop partnerships,
- share fish detection data among projects and
- equipment (in some cases).

Became broader than just GLFC – GLRI projects, GLATOS to serve all projects in the basin!

Slide by Chuck Krueger

History

- **Web site … http://glatos.glos.us/**



GLOS funded website construction.

GLOS
www.glos.us

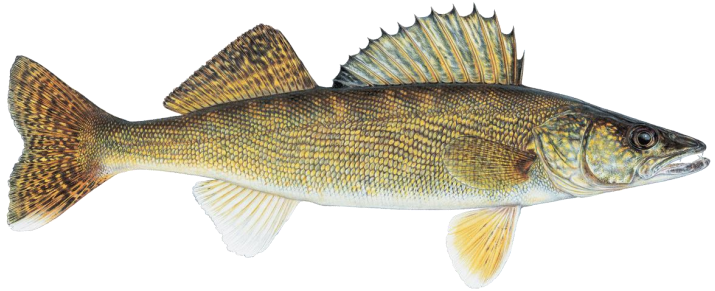

GLATOS
Great Lakes Acoustic Telemetry Observation System
Unraveling the mysteries of fish in the Great Lakes
Home
About
Map
Projects
Publications
Photos
Report-A-Tag
Data Portal
Contact
Explore Tool
The map depicts ongoing receiver deployments by default. Place your cursor over points on the map to view additional information about projects and receivers. Use the tools below to filter receivers by project, operating schedule, acoustic frequency, model and receiver deployment status.
Filter by project
BHLAS: Buffalo Harbor Lake Sturgeon 23
CRSAC: CAWS Asian Carp Telemetry 29
DFOWS: Direct Movement of Non-indigen... 37
DRMLT: Drummond Island Lake Trout Sp... 5
EGRWE: Lake Erie Grand River Walleye 2
ELEWE: Eastern Lake Erie Walleye 18
ELOBB: Eastern Lake Ontario Black Bass 23
FIMSA: Fighting Island Multi-Species Asse... 59
GBSTG: Movement and Fidelity of Green B.. 8
GBYWL: Bruce Peninsula to Manitoulin Isla.. 19
Filter by operating schedule
Filter by acoustic frequency
Filter by model
Filter by status, date, or year
Denotes Receiver Station
Change map background
Reset map zoom
+
−

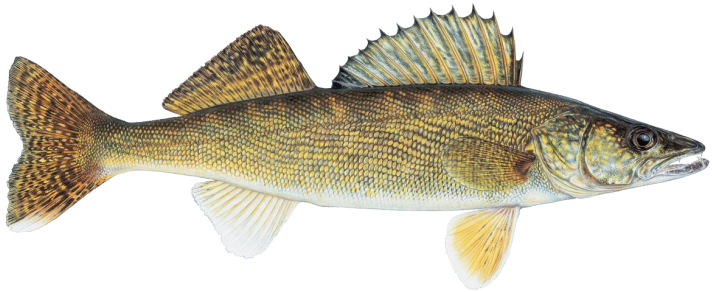
What are the current GLATOS statistics?

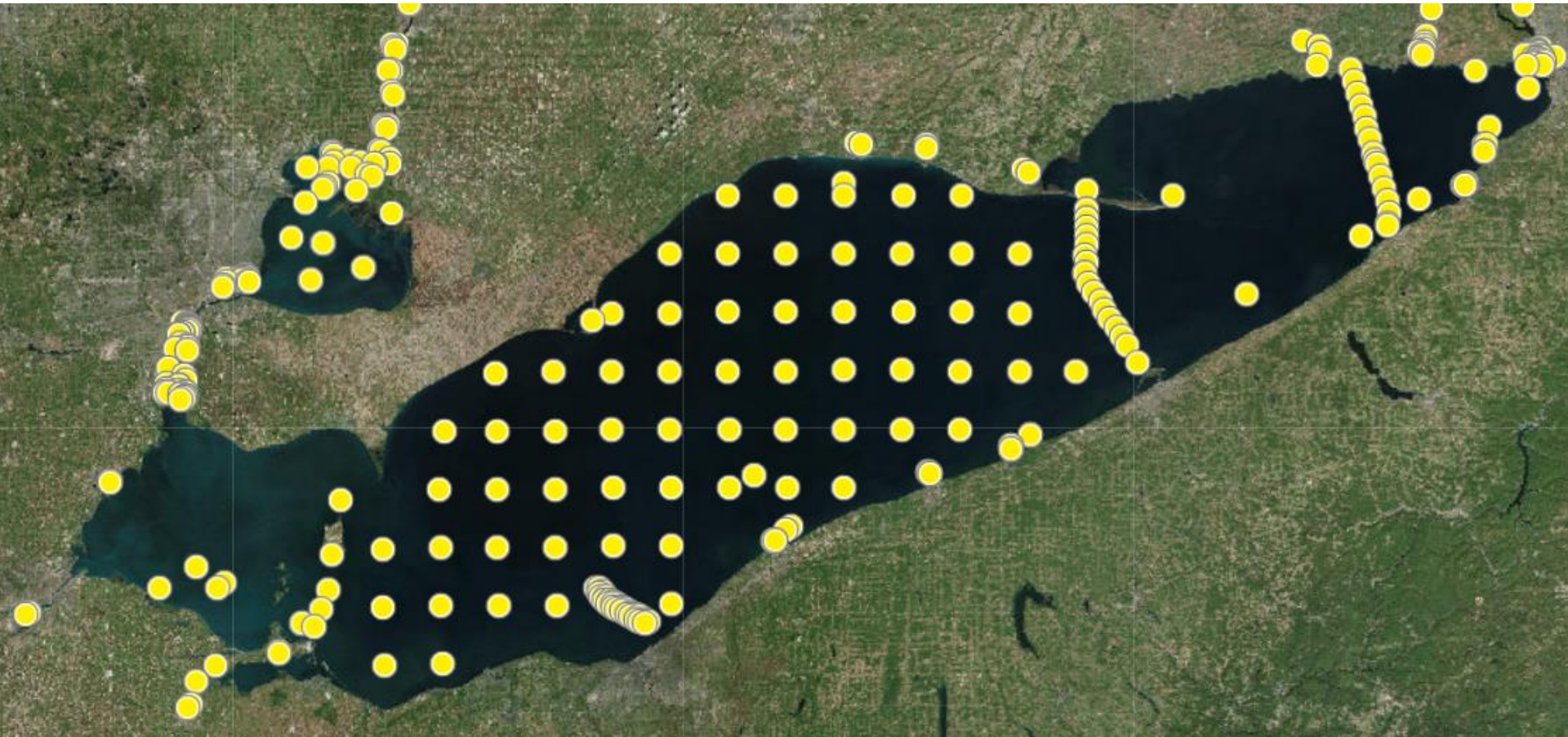
- 43 projects
- 36 species tagged
- 1,967 receivers
- 6,617 tagged fish released
- 118,832,131 fish tag detections in data base
- ~30 peer-review publications

Data from Chuck Krueger

Evaluating Methods for Estimating Mortality of Great Lakes Walleye using Acoustic Telemetry

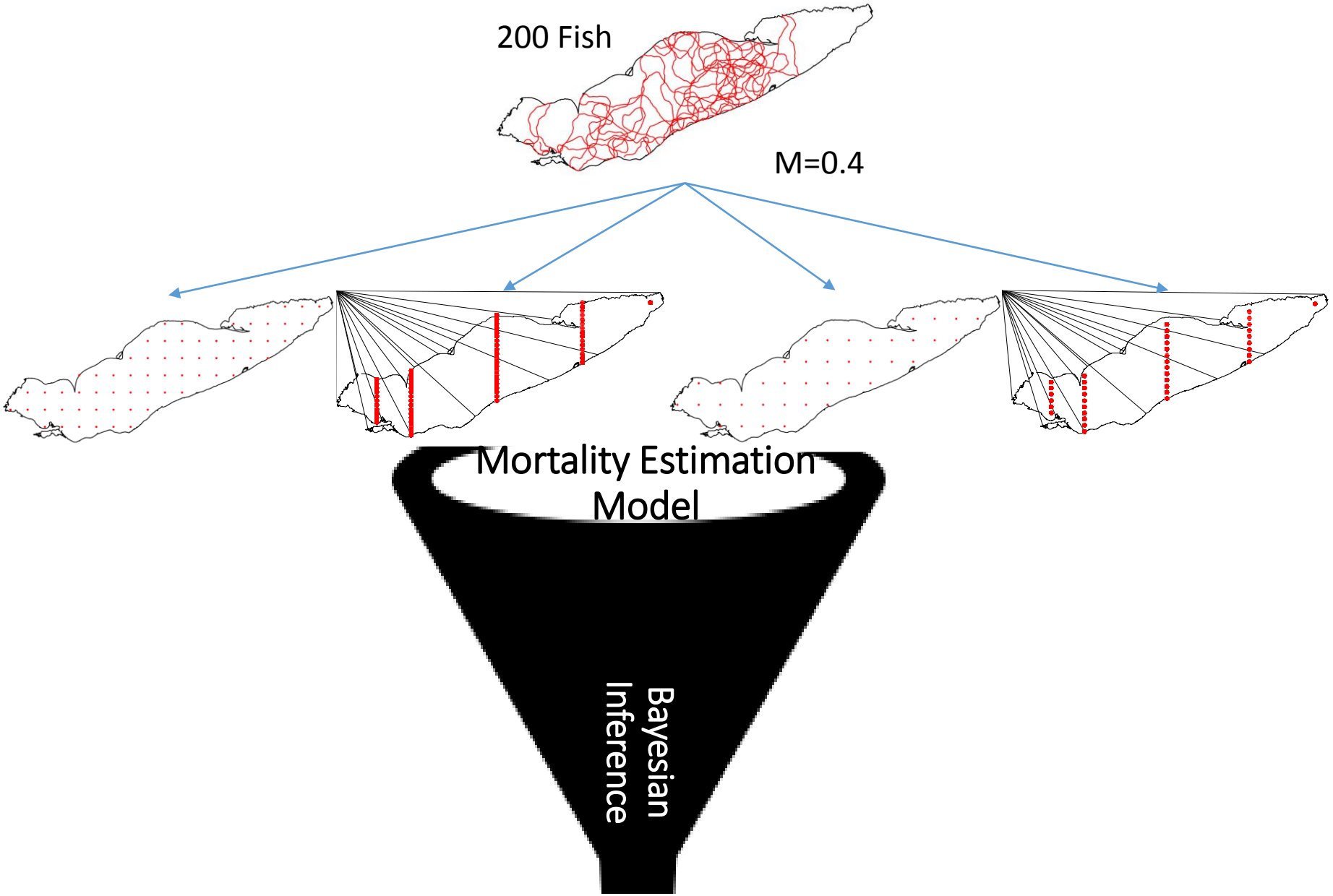






Simulation framework

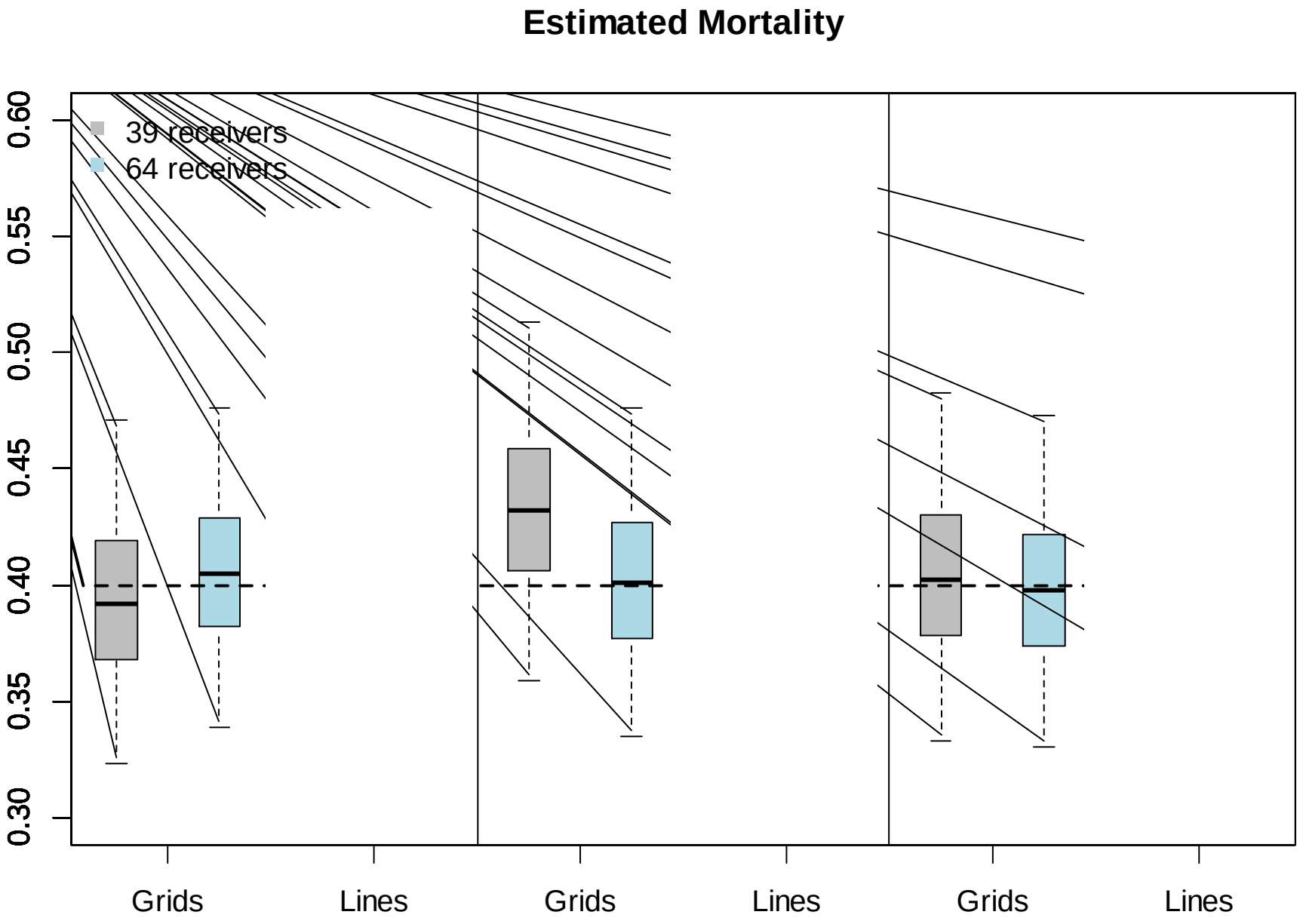
"True" system -> "Observed" system



4 M estimates (true M = 0.4)

12 M estimates (true M = 0.4)

True Mortality = 0.4



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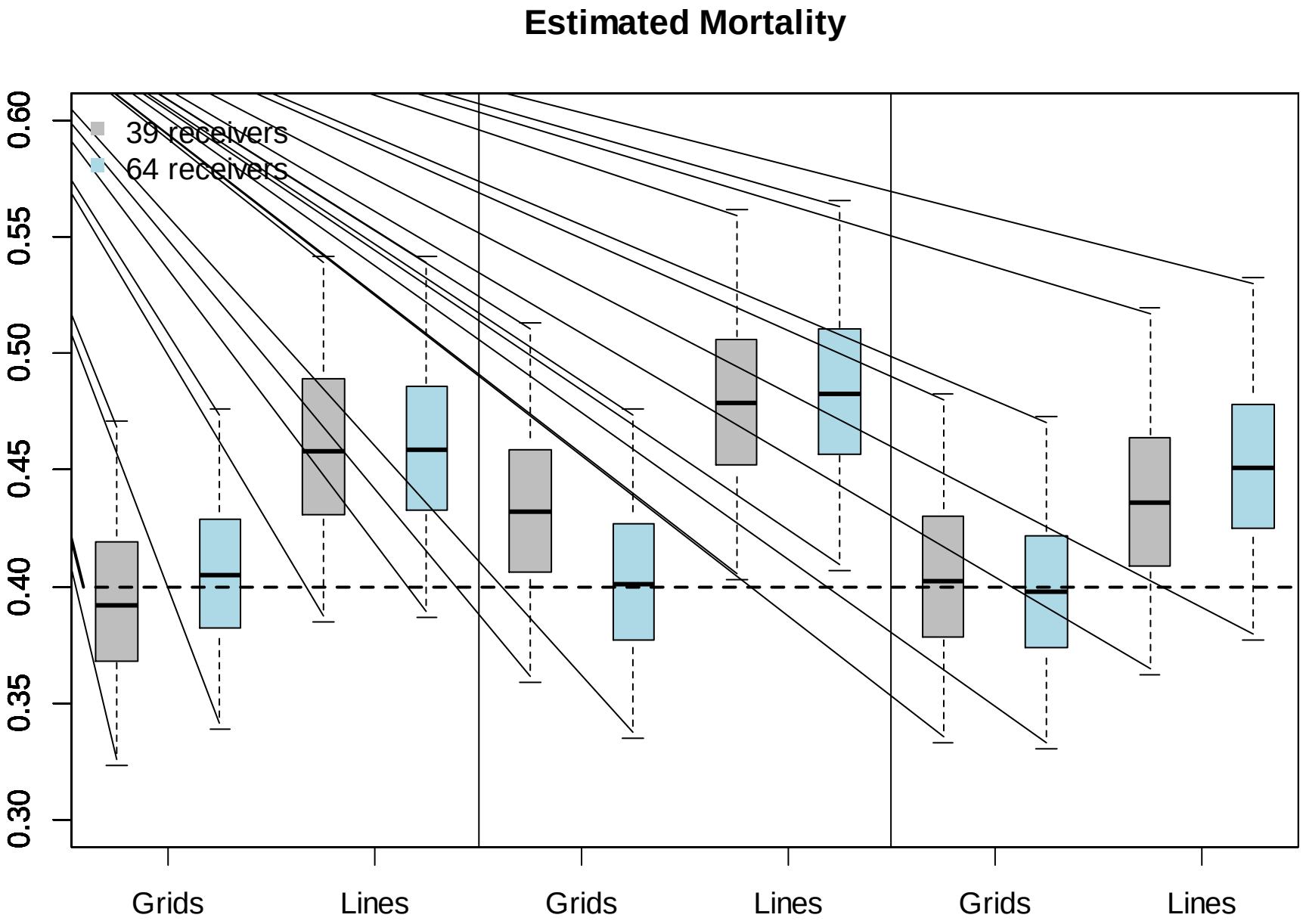
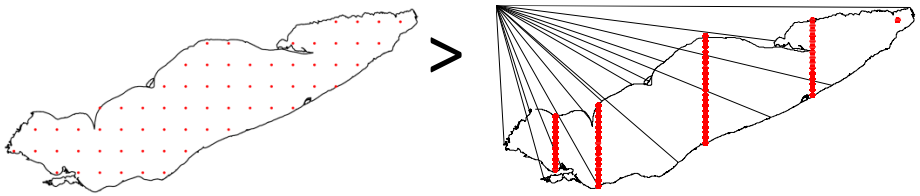
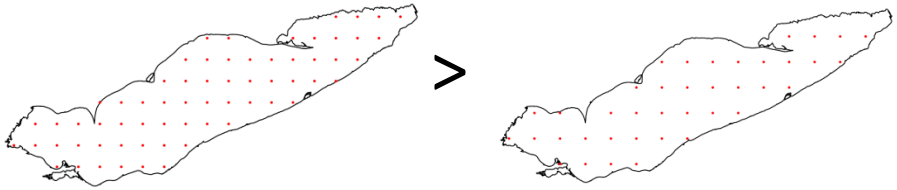


Acoustic telemetry data can estimate mortality rates reasonably well

- Grids perform better than lines



- 64 receivers is better than 39



Final thoughts on Acoustic Telemetry and GLATOS

- Spatial data collected without having to recapture the fish
- More than just where the fish move
- Tags getting fancier

- Unique collaboration
- More opportunities
- On-going investment

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