



Tab A, No. 8

OIL SPILL SCIENCE

SEA GRANT PROGRAMS OF THE GULF OF MEXICO

The Deepwater Horizon Oil Spill: Impacts on Gulf of Mexico Fisheries

Christine Hale

Oil Spill Science Outreach Specialist

Texas Sea Grant

at Texas A&M University



Texas • Louisiana • Florida
Mississippi-Alabama



Gulf of Mexico Fishery Management Council Meeting
Austin, TX
April 6th 2016

gulfseagrants.org/oilspilloutreach

Sea Grant – GoMRI partnership

\$500 Million, 10-year investment

Study how oil and dispersants:

- Move around and interact
- Impact people, wildlife, and the environment



[Dispatches From The Gulf](#)
[- video short](#)



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Sea Grant – GoMRI partnership



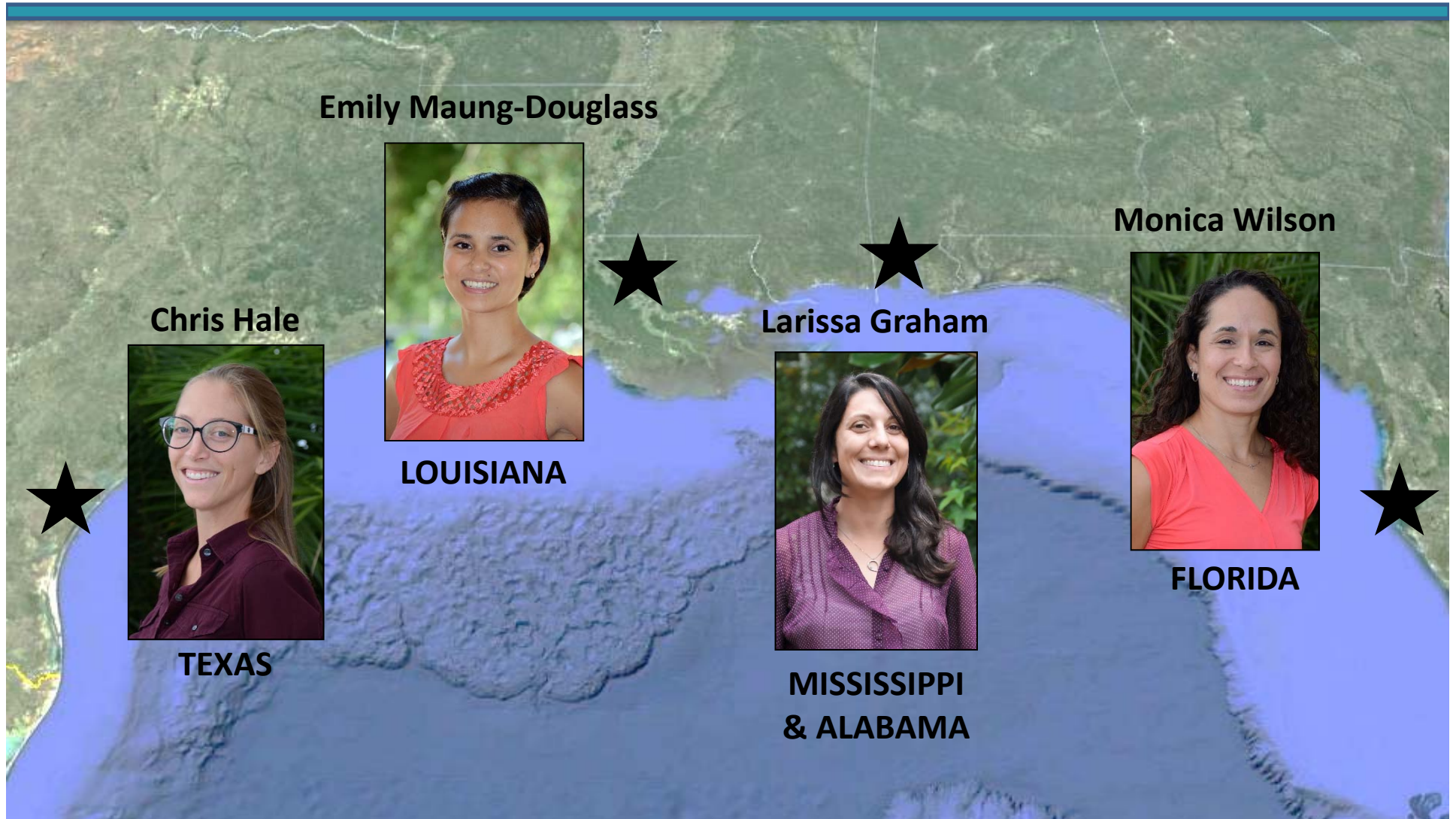
Research + Extension
Science-based
Non-advocacy
Embedded in and trusted
by coastal audiences

Mission: Enhance the practical use and conservation of coastal, marine and Great Lakes resources in order to create a sustainable economy and environment



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Oil Spill outreach Specialists



A satellite-style map of the Gulf of Mexico region is the background. Five black stars are placed on the map to indicate the locations of the specialists: one on the Texas coast, one in Louisiana, one in Mississippi and Alabama, one in Florida, and one in the northern Gulf region. Each star is associated with a portrait of a specialist and a label for their region.

Emily Maung-Douglass

Chris Hale
TEXAS

Louisiana

Larissa Graham
MISSISSIPPI & ALABAMA

Monica Wilson
FLORIDA

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Outreach Team outputs

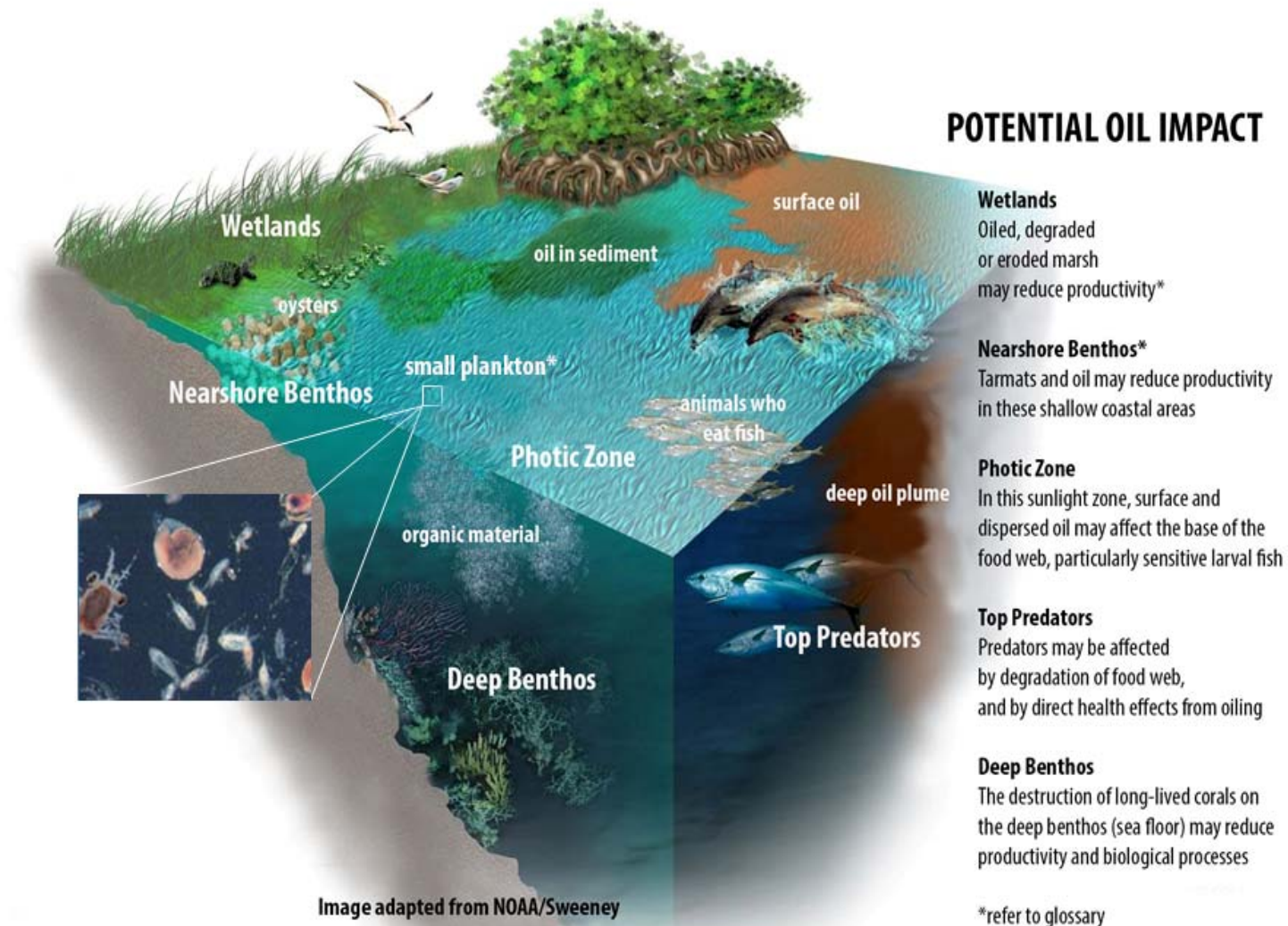
Sharing peer-reviewed, published science

- Science outreach publications
 - Focused on science topics identified by our audiences
- Science seminars & input sessions
 - Presentations by experts
 - Continue to identify needs of coastal audiences



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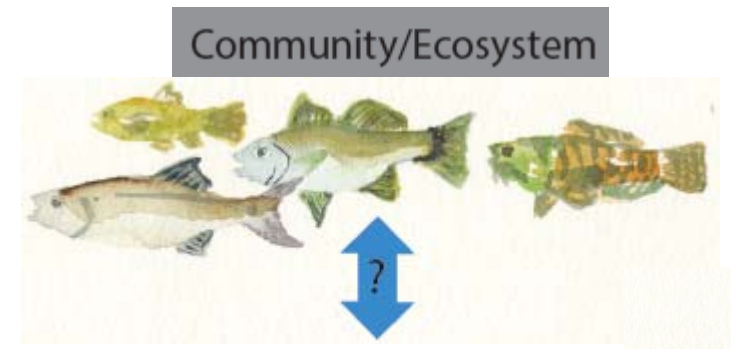
Ecosystem Impacts



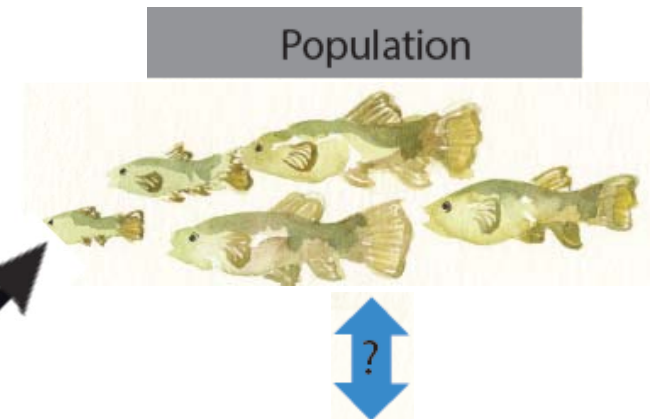
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Understanding fisheries impacts from oil spills: 3 level approach

How do oil spills impact many different kinds of living things in an area or habitat?



How do oil spills impact a group of living things of the same species?



How do oil spills impact individuals?



Organism/Individual



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Individual fish impacts

FISH are good at breaking down the bad stuff in oil!

- Oil metabolizing gene (CYP1A) triggers production of proteins that will breakdown PAHs in fish
- Animals without CYP1A bioaccumulate
- CYP1A is a biomarker for oil exposure in fish



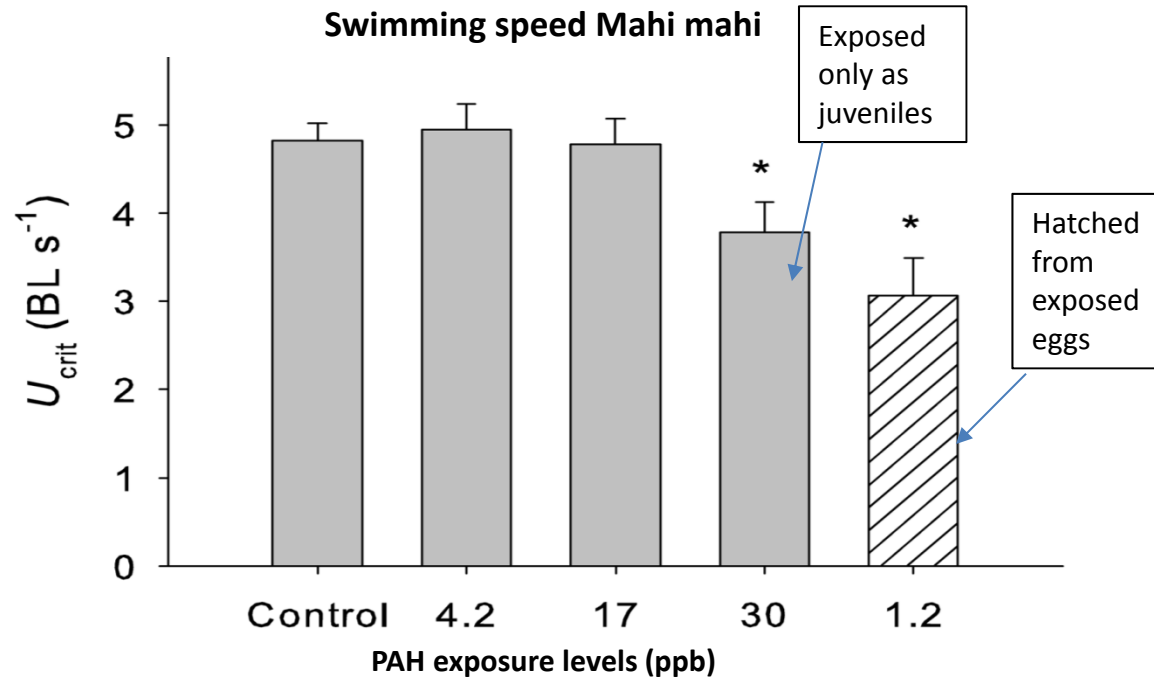
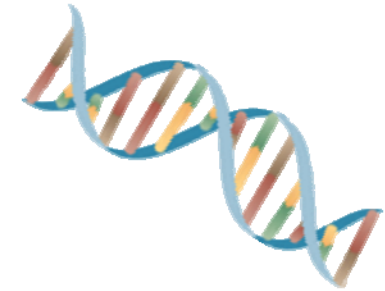
BUT chemicals in oil can cause:

- Decreased swimming speed
- Decreased size
- Deformities

(Sensitivity and impact varies by life stage)



Individual fish impacts

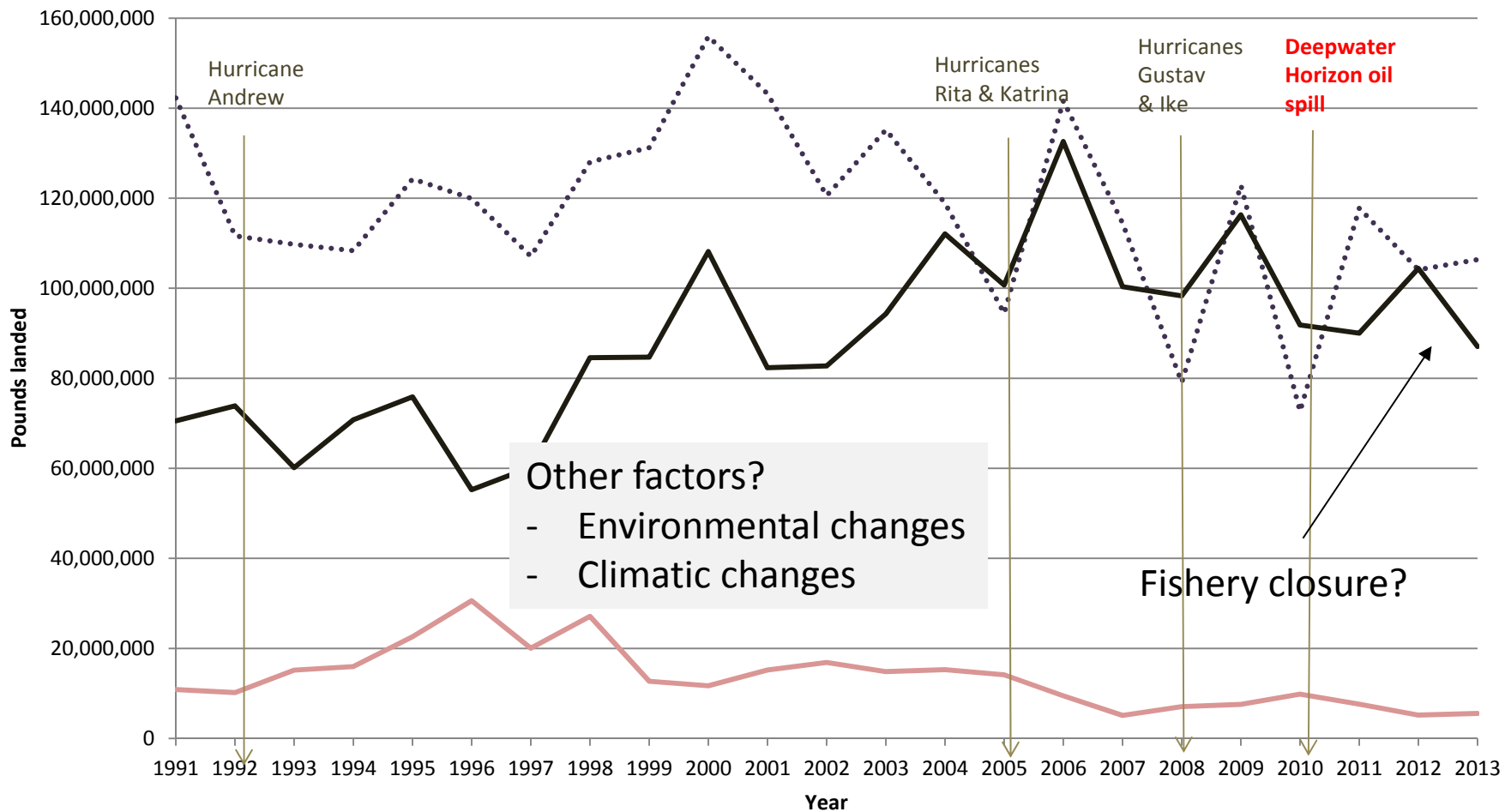


Mager et al. (2014)

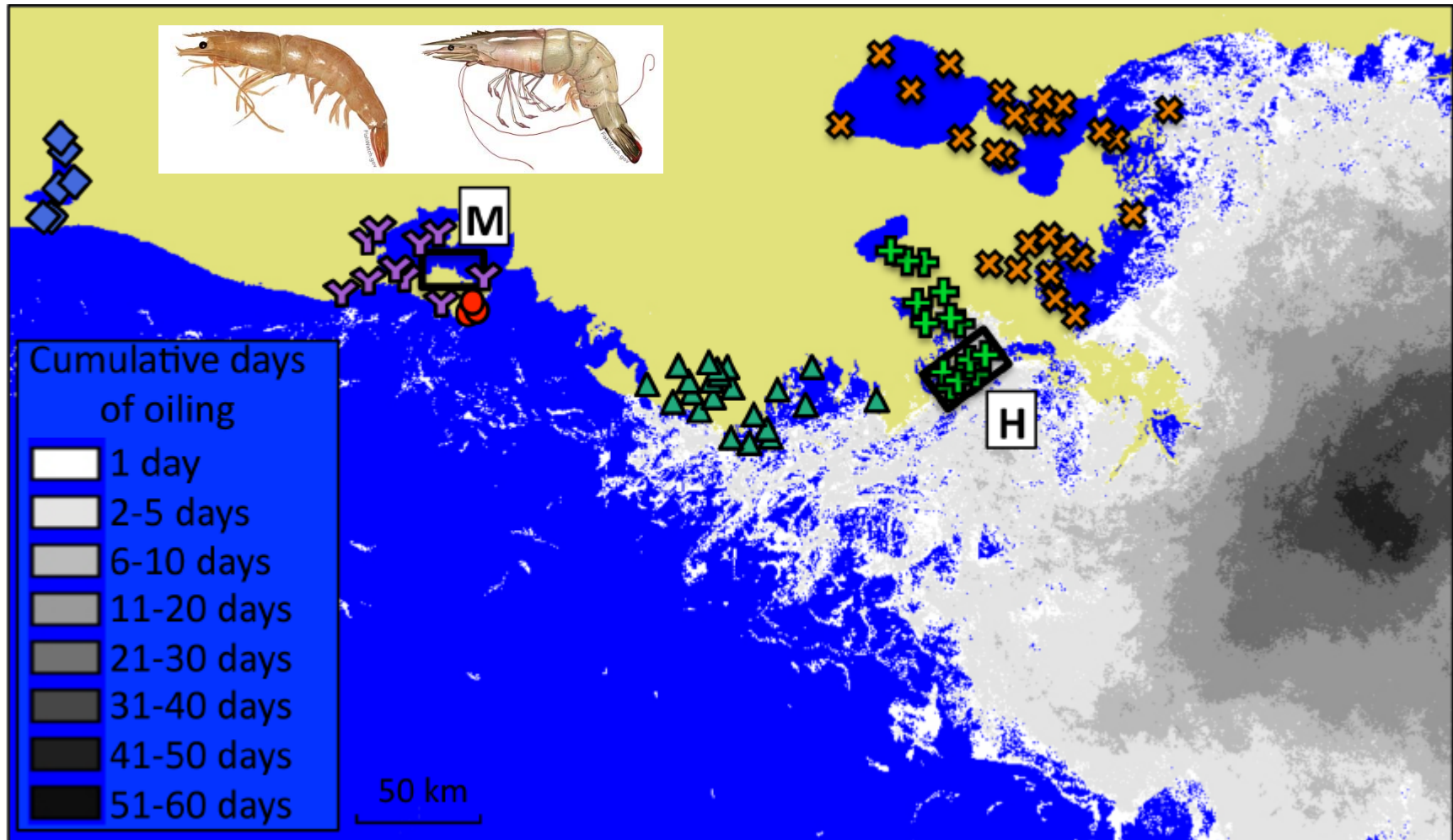
Population impacts: fishery – dependent research

Shrimp in the Gulf of Mexico: Commercial Landings (pounds), 1991-2013

..... Brown — Pink — White



Population impacts: fishery – independent research

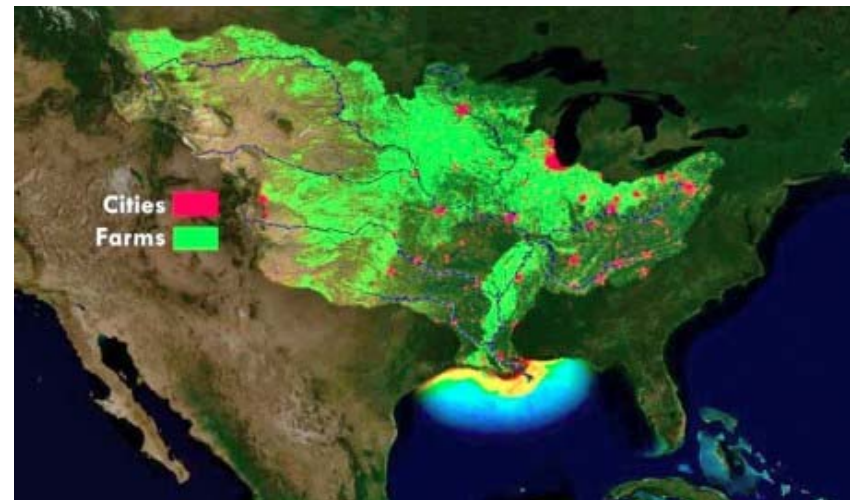


van der Ham & der Mutsert 2014

Population Impacts

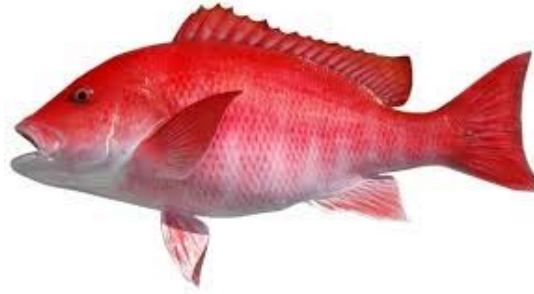
Blue crab pop. modeling study

- larval dispersal & settlement
- blue crab larvae virtually exposed to DWH oil
- species specific & location specific results: MS River Delta



Community Impacts

- Pre-spill normal:
 - shrimp, crabs, squid but also a 15 – 20% zooplankton



- Post-spill diet shift attributed to DWH
 - more fish & crustaceans and less zooplankton

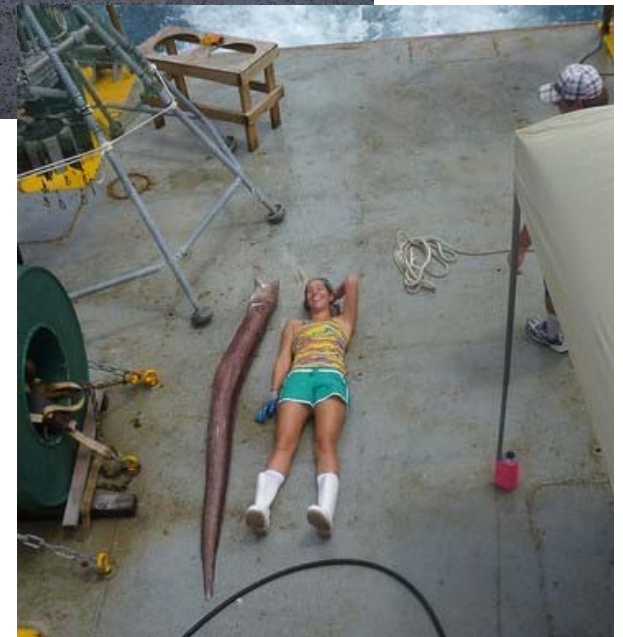


Tarnecki & Patterson 2015

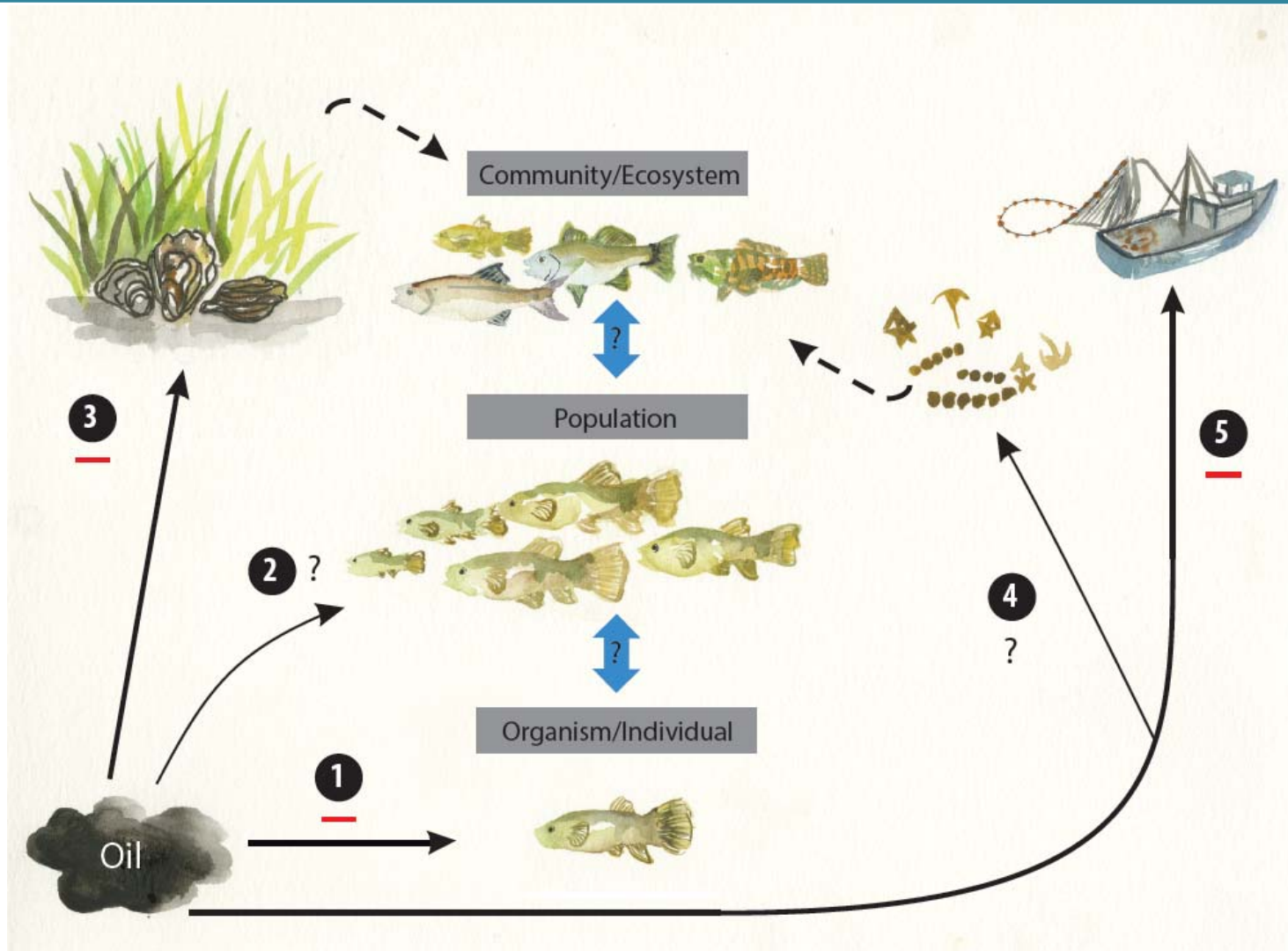
Community Impacts



- Deep sea fish are exposed to PAHs in different ways
- Fish habitat and fish behavior play a key role in exposure
- Golden tilefish had significantly higher levels of PAH for a few years after the oil spill



Ecosystem Impacts: Populations & Communities



Adapted from Fodrie et al. 2014

- 1 Physiological & developmental consequences
- 2 Potential mortality, especially during larval & juvenile stages
- 3 Habitat loss, degradation, or alteration
- 4 Changes in base of food chain
- 5 Fishery closures

Established *negative* effects of oil

Effects of oil are unclear

Indicates *direct* effects of oil

Indicates *indirect* effects of oil



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- sign up for our email updates
- Access our pubs, join seminars
- click to share your thoughts and questions:

Share your
thoughts
(Click here)

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Chilling with your chums: How did the oil spill impact Gulf fisheries?

April 6, 2016 at 6pm - DeWitt room
Doubletree, 6505 Interstate Highway 35-N, Austin, TX

Register to attend: [HERE](#)

Watch live online: [HERE](#)



Scientists will talk about how the
oil spill impacted:

Fish populations and fisheries
Dr. Joel Fodrie, Univ of North Carolina

Fish development
Dr. Ben Dubansky, Univ of North Texas



Food will be provided and
one drink ticket will be given
to those that [register](#).



Learn more and see the full agenda:
[http://gulfseagrant.org/oilspilloutreach/
presentations/](http://gulfseagrant.org/oilspilloutreach/presentations/)

QUESTIONS? Contact -

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Larissa Graham with MS-AL Sea Grant at Larissa.Graham@auburn.edu



Science Social TONIGHT!

Learn more while
you eat and
have a drink on us 😊

5:30 pm

in the DeWitt Room

gulfseagrant.org/oilspilloutreach



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