



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

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



Texas • Louisiana • Florida
Mississippi-Alabama



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



gulfseagrant.org/oilspilloutreach

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



gulfseagrant.org/oilspilloutreach

Oil Spill outreach Specialists

Emily Maung-Douglass



LOUISIANA

Monica Wilson



FLORIDA

Larissa Graham



MISSISSIPPI
& ALABAMA

Chris Hale



TEXAS

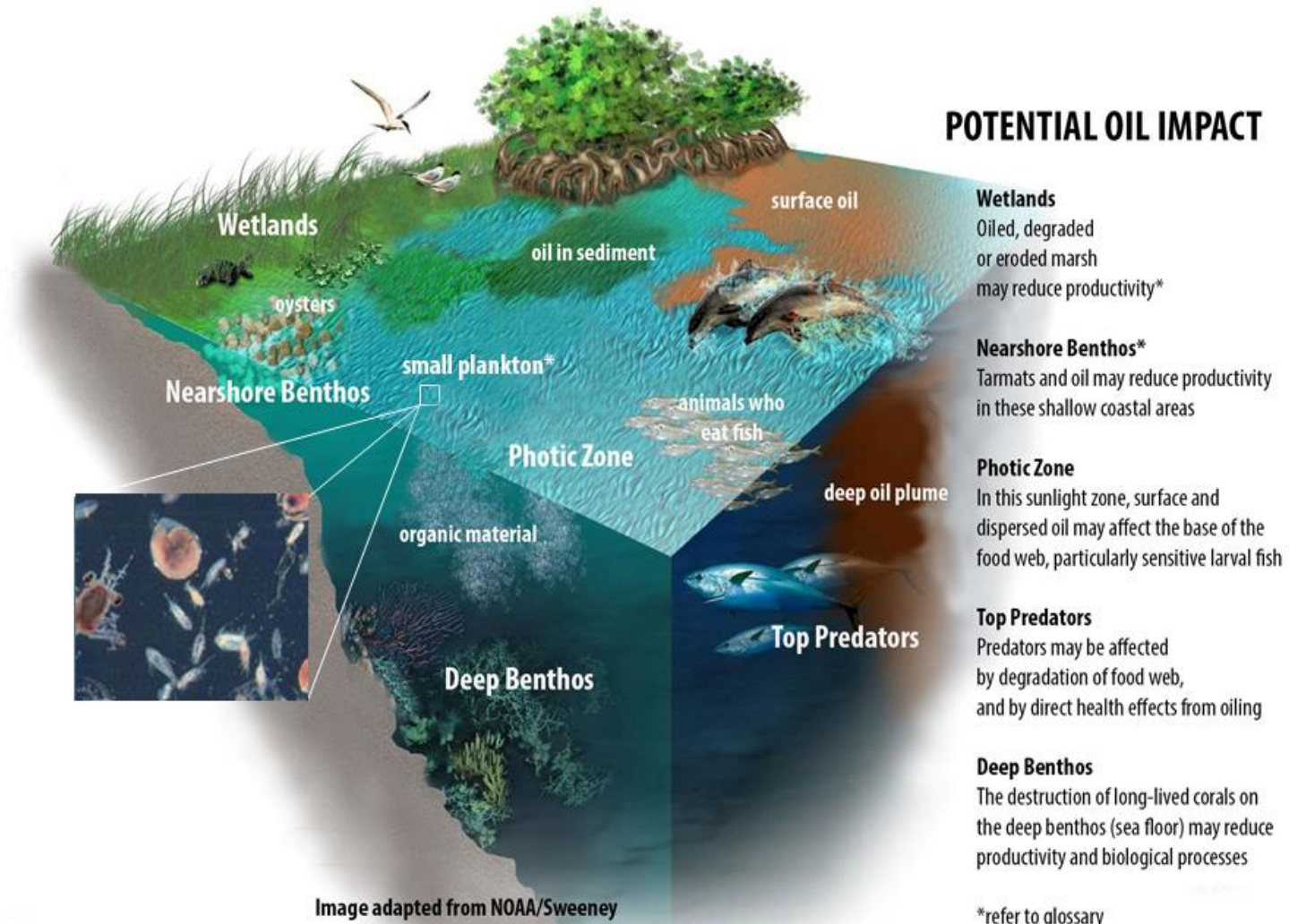
Outreach Team outputs

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

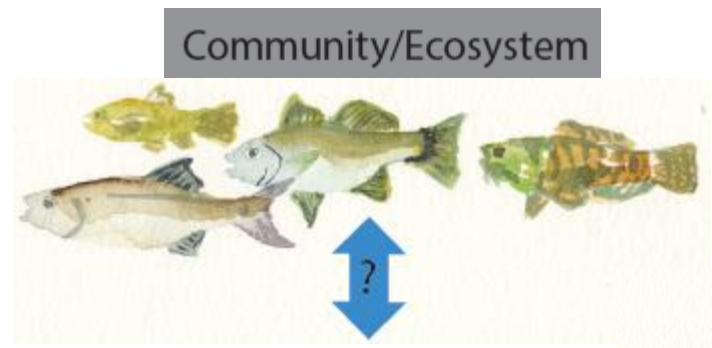


Ecosystem Impacts

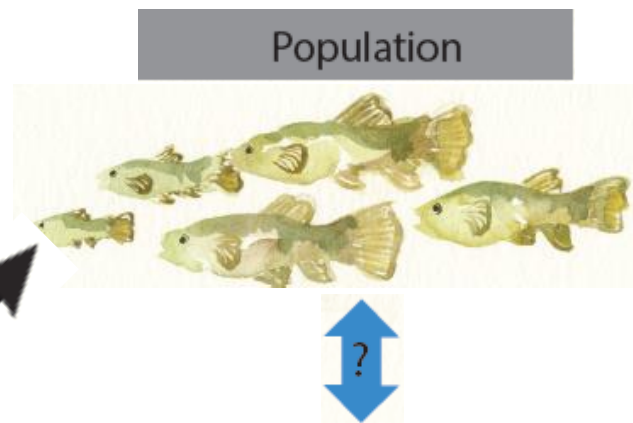


Understanding fisheries impacts from oil spills: 3 level approach

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



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



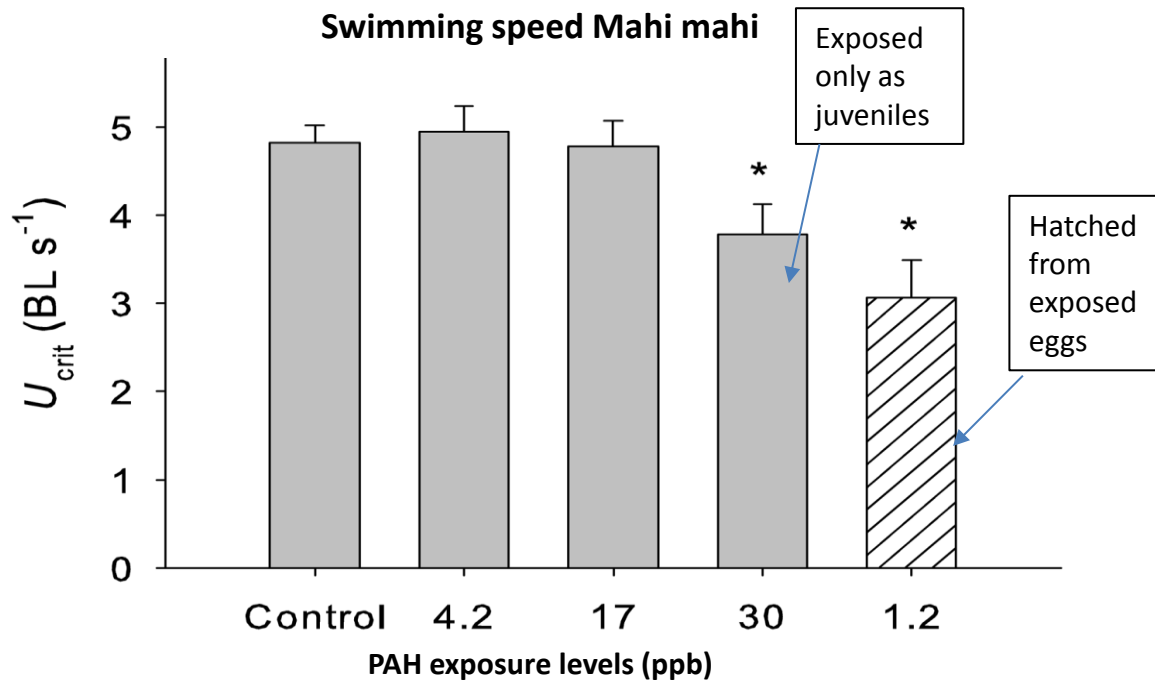
BUT chemicals in oil can cause:

- Decreased swimming speed
- Decreased size
- Deformities

(Sensitivity and impact varies by life stage)



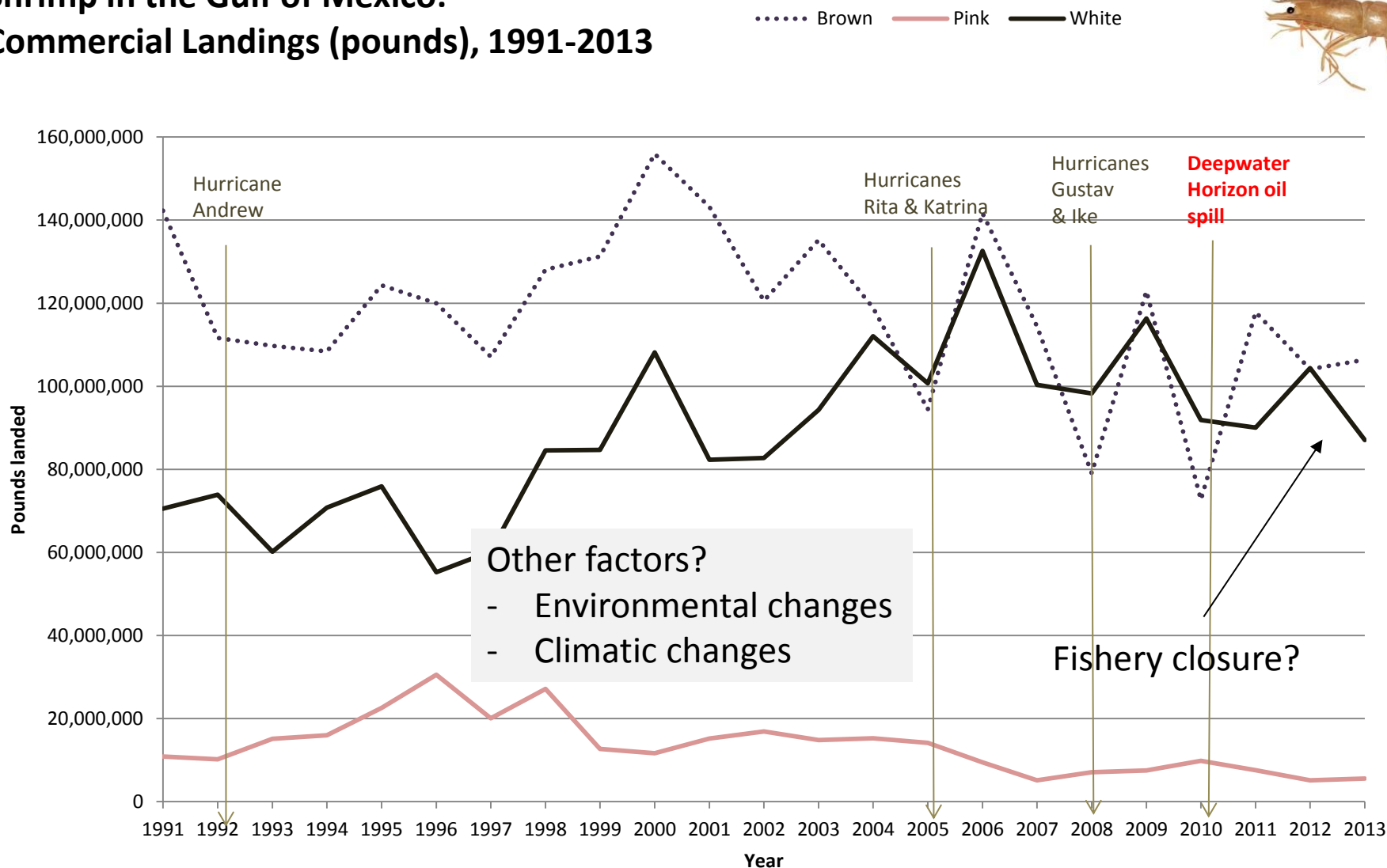
Individual fish impacts



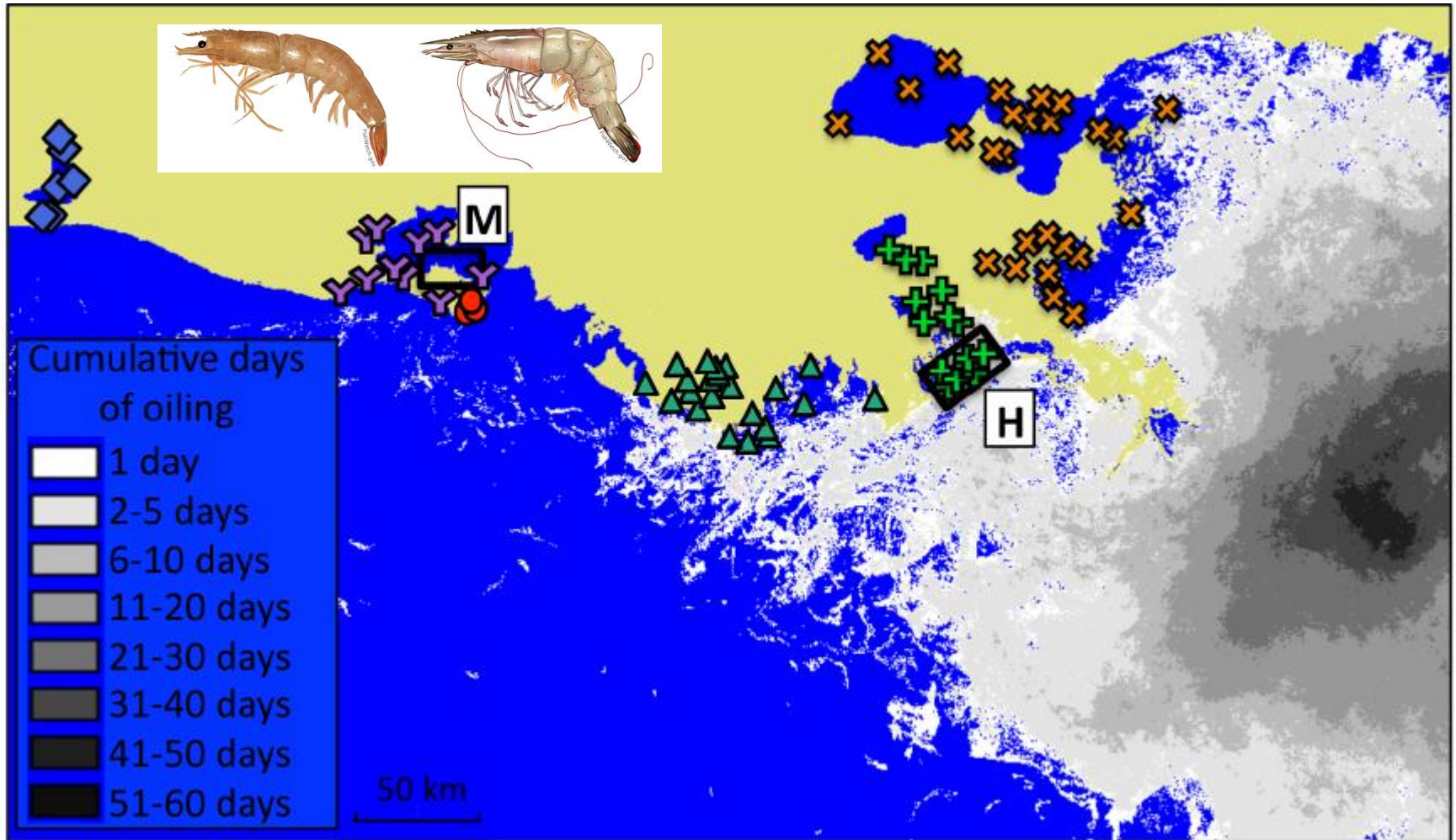
Mager et al. (2014)

Population impacts: fishery – dependent research

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



Population impacts: fishery – independent research

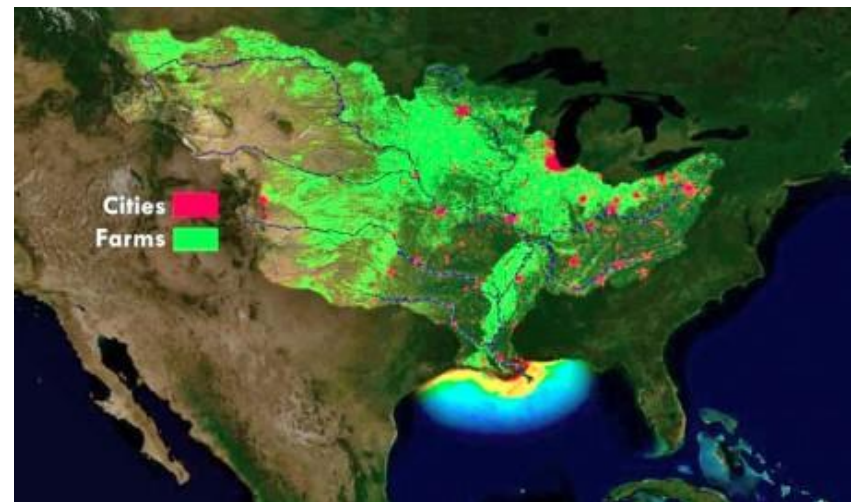


van der Ham & der Mutsert 2014

Population Impacts

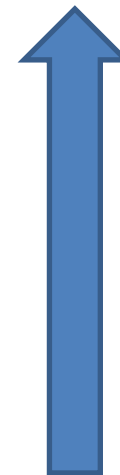
Blue crab pop. modeling study

- 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

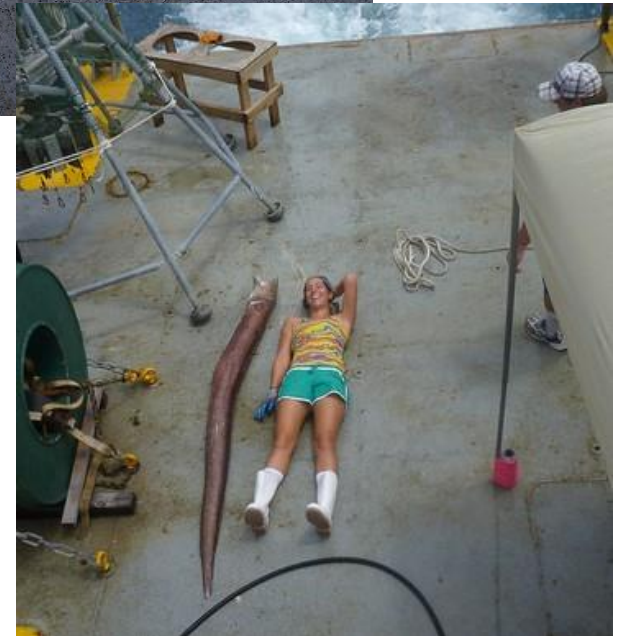


Tarnecki & Patterson 2015

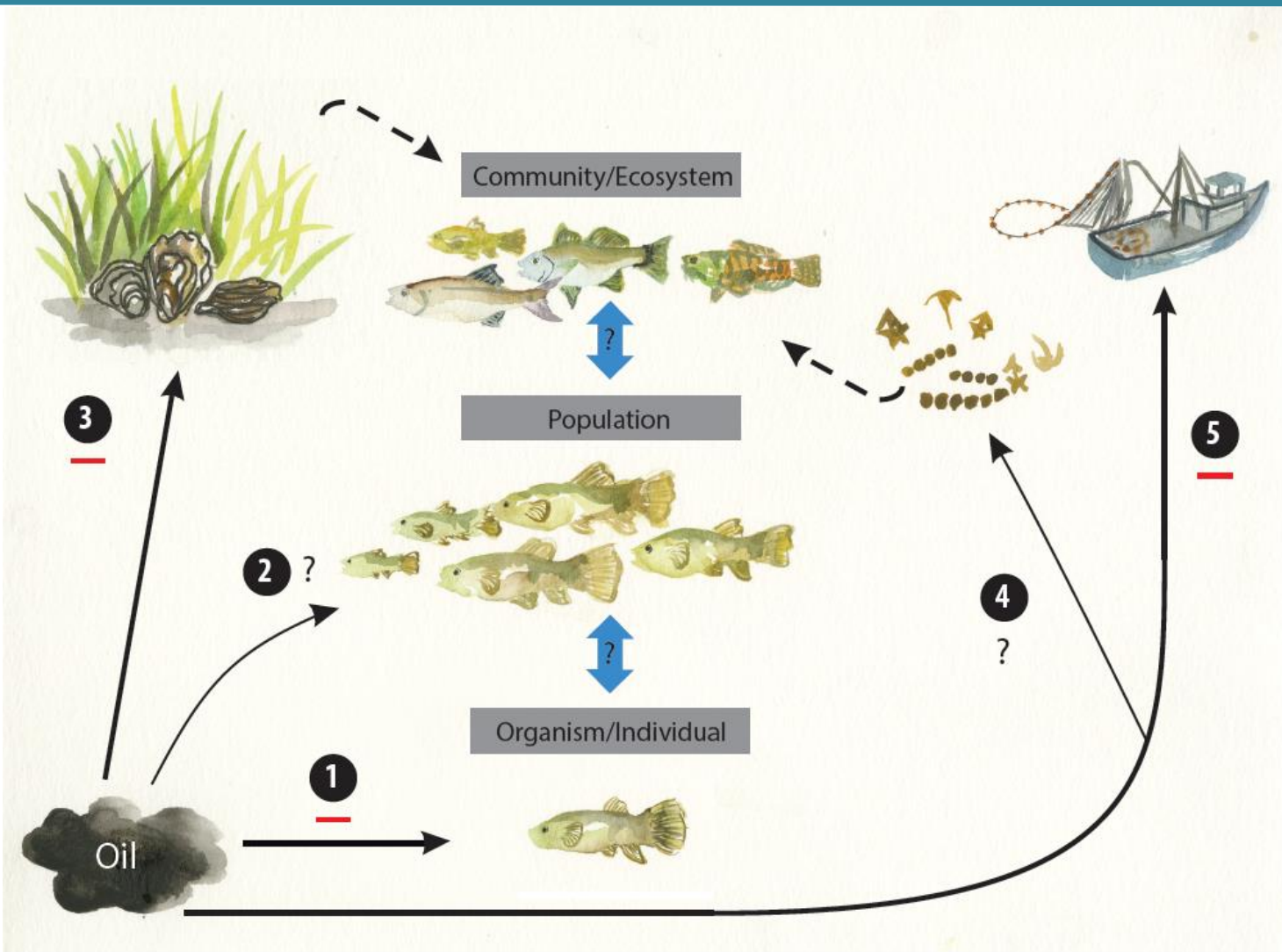
Community Impacts



- 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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Visit our website gulfseagrant.org/oilspilloutreach

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

Share your
thoughts
(Click here)

gulfseagrant.org/oilspilloutreach

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://gulfseagrants.org/oilspilloutreach/
presentations/](http://gulfseagrants.org/oilspilloutreach/presentations/)

QUESTIONS? Contact -

Christine Hale with TX Sea Grant at Chris.Hale@tamu.edu

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

gulfseagrants.org/oilspilloutreach



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