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Strengths and Challenges

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April 14, 2015

Right Whale Background

- Still one of the most endangered cetaceans
- Recovering but very slowly
- Vulnerable to decline
- Resources thrown at problem
- Mortality
- Reproduction
 - NARW : 17 = 1991 and 17 = 2015
 - SRW : 18 = 1991 and 79 = 2013



Right Whale Background

- Modeling
 - Mark-recapture
 - Habitat models
- Entanglements
 - 40 whales being monitored
 - Cryptic mortality
 - Drag & Morbidity
 - Reproductive underproduction

Large Whales

- Changing seasonal behavior and distribution
- Adapt population monitoring methods
- Estimate cause-specific mortality (entanglement)
- Assign country of origin to entangling gear
- Evaluate efficacy of ALWTRP measures
- Real-time monitoring to inform management
- Evaluate methods – vessel, aerial, acoustic

Strengths

- Forefront of passive acoustics for conservation
- Substantial publication record
- Impressive amounts of right whale data collected
- Track record of collaboration and data sharing
- Assessing effectiveness of management measures

Challenges

- Passive Acoustics group run on soft money
- Aerial survey dilemma
- Management expects substantial current data

I told her we were going to get married, and all she could talk about was frogs.

She said there's these hills where it's hot and rains all the time, and in the rainforests there are these very tall trees and right in the top branches of the trees there are these like great big flowers called . . . bromeliads, I think, and water gets into the flowers and makes little pools and there's a type of frog that lays eggs in the pools and tadpoles hatch and grow into new frogs and these little frogs live their whole lives in the flowers right at the top of the trees and don't even know about the ground, and once you know the world is full of things like that, your life is never the same.

—Masklin, Terry Pratchett's **The Bromeliad Trilogy**

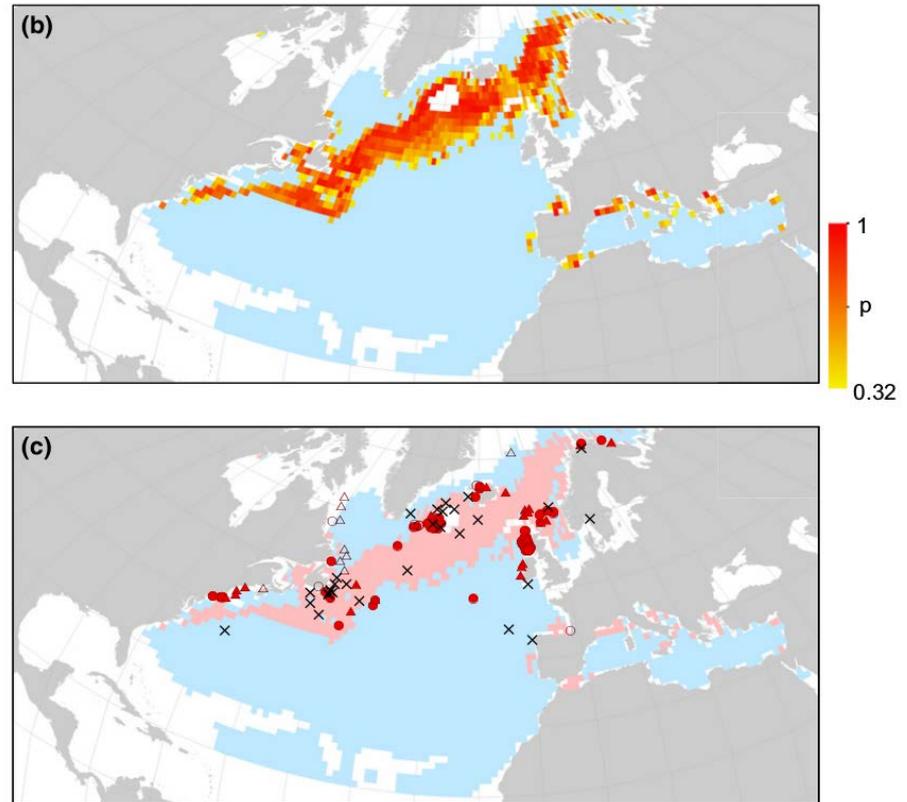


http://imgs.xkcd.com/comics/terry_pratchett.png

What next?

“An approximate answer to the right question is worth a great deal more than a precise answer to the wrong question.”

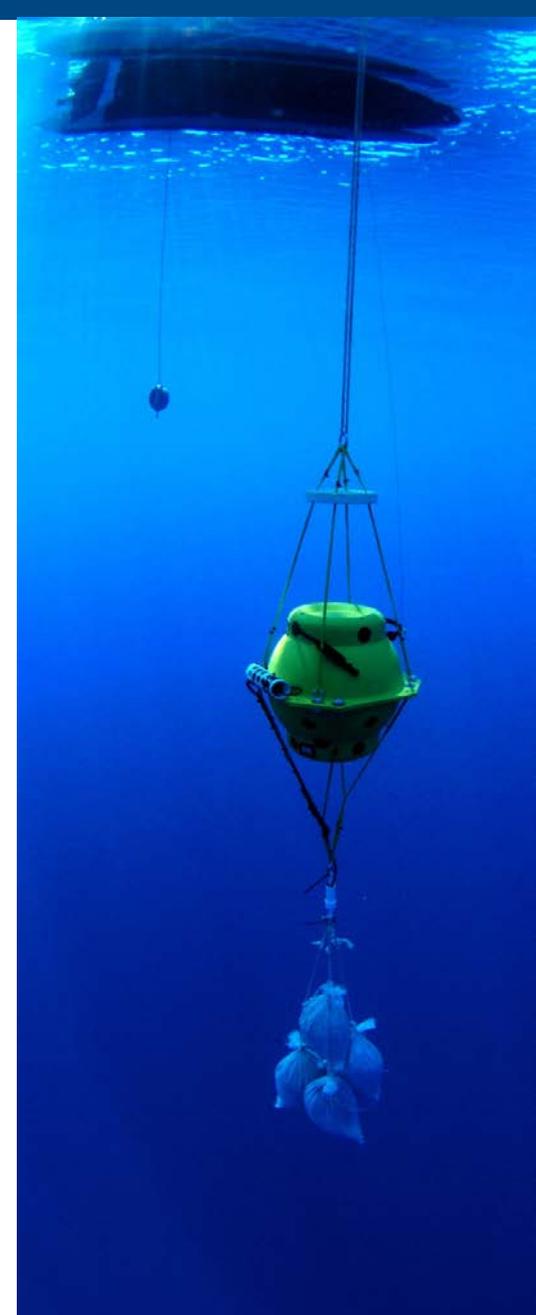
- Tukey



.Figure 2 in Monsarrat et al. Historical summer distribution of the endangered North Atlantic right whale (*Eubalaena glacialis*): a hypothesis based on environmental preferences of a congeneric species. **Diversity and Distributions**, 2015 1–13

Recommendations: Acoustics

- Secure permanent funding
- Integrate visual and telemetry
- Relative or absolute abundance?
- Out of the box thinking?



Recommendations: Surveys

- Maintain support:
 - Photo ID Catalog
 - Sightings Database
 - Aerial and Vessel Surveys
 - Necropsy
 - Calf biopsy
- Revisit satellite telemetry?
- New tools – especially UAS



Priorities

- Estimate “takes” or analyze where whales are?
- Increasing industrialization of US EEZ
- Models or design-based approaches?
- Mine available data or conduct fieldwork?