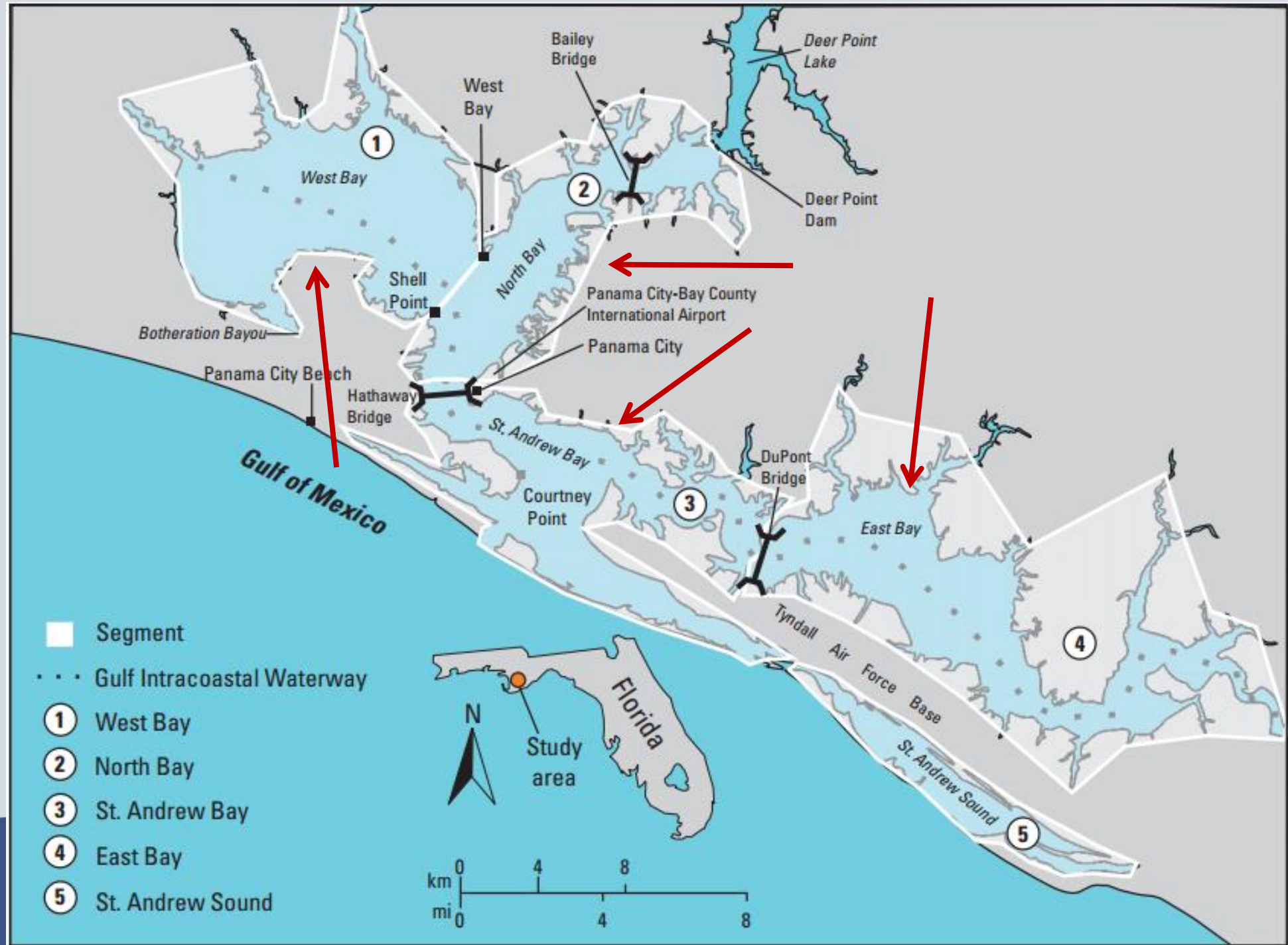# Using Side Scan Sonar to Estimate Height, does it Work?
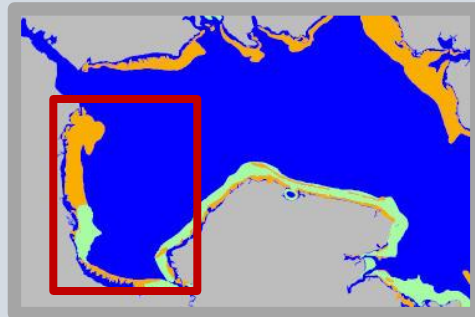

Florida Fish & Wildlife Conservation Commission
Division of Habitat and Species Conservation
Aquatic Habitat Conservation and Restoration

Legend:
- ■ Segment
- ⋯ Gulf Intracoastal Waterway
- ① West Bay
- ② North Bay
- ③ St. Andrew Bay
- ④ East Bay
- ⑤ St. Andrew Sound

What We Have Done So Far

Phase I

Phase II

Segrass Coverage 1964
Seagrass Coverage 2010
Oyster Reefs

2.25 miles
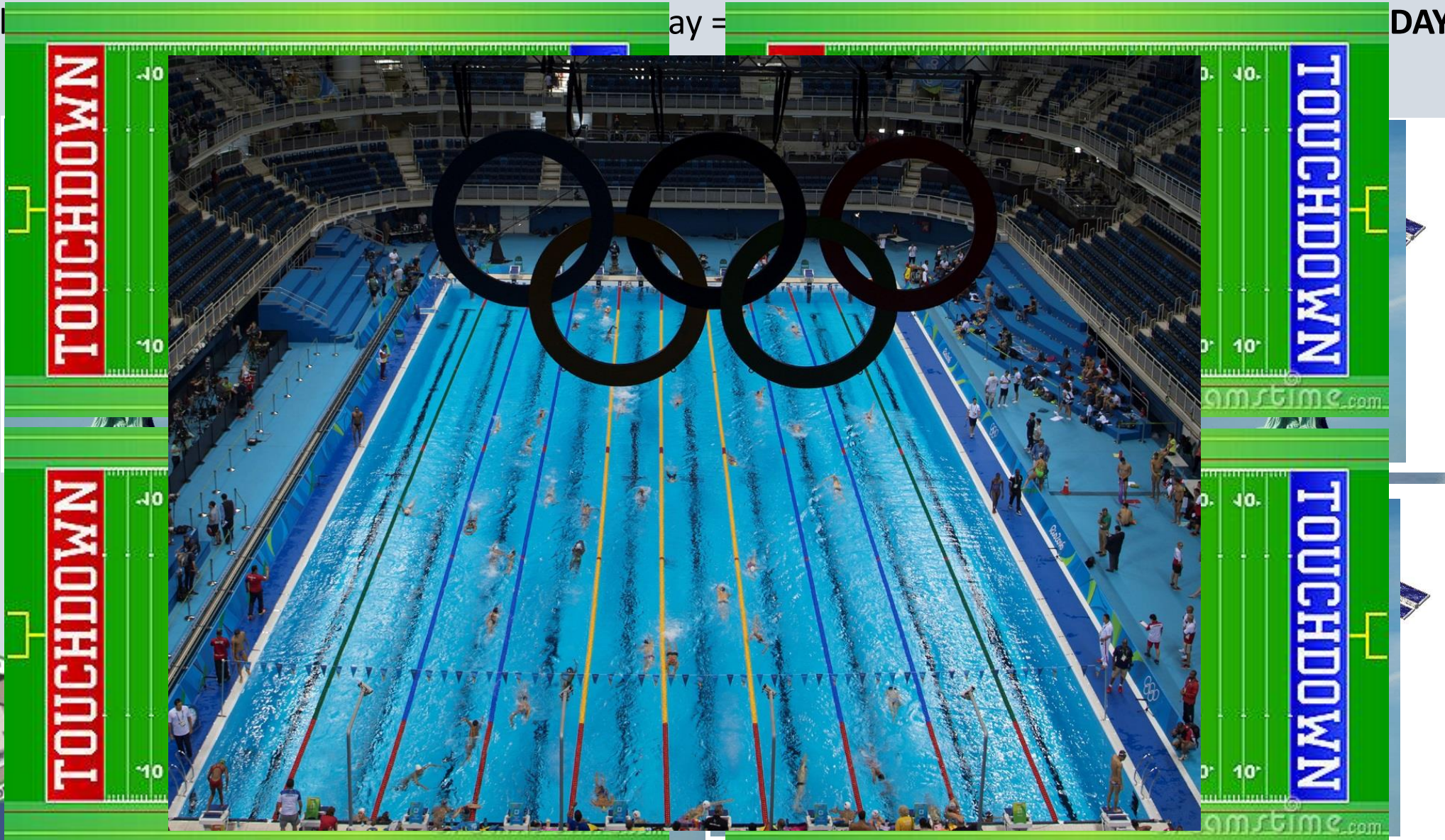
Miles
0.1 0 0.1 0.2 0.3

N

Nature of the Challenge

- **4.25 acres** of oyster reef = 4 football fields
- Capable ... ay = ... DAY
- Phase
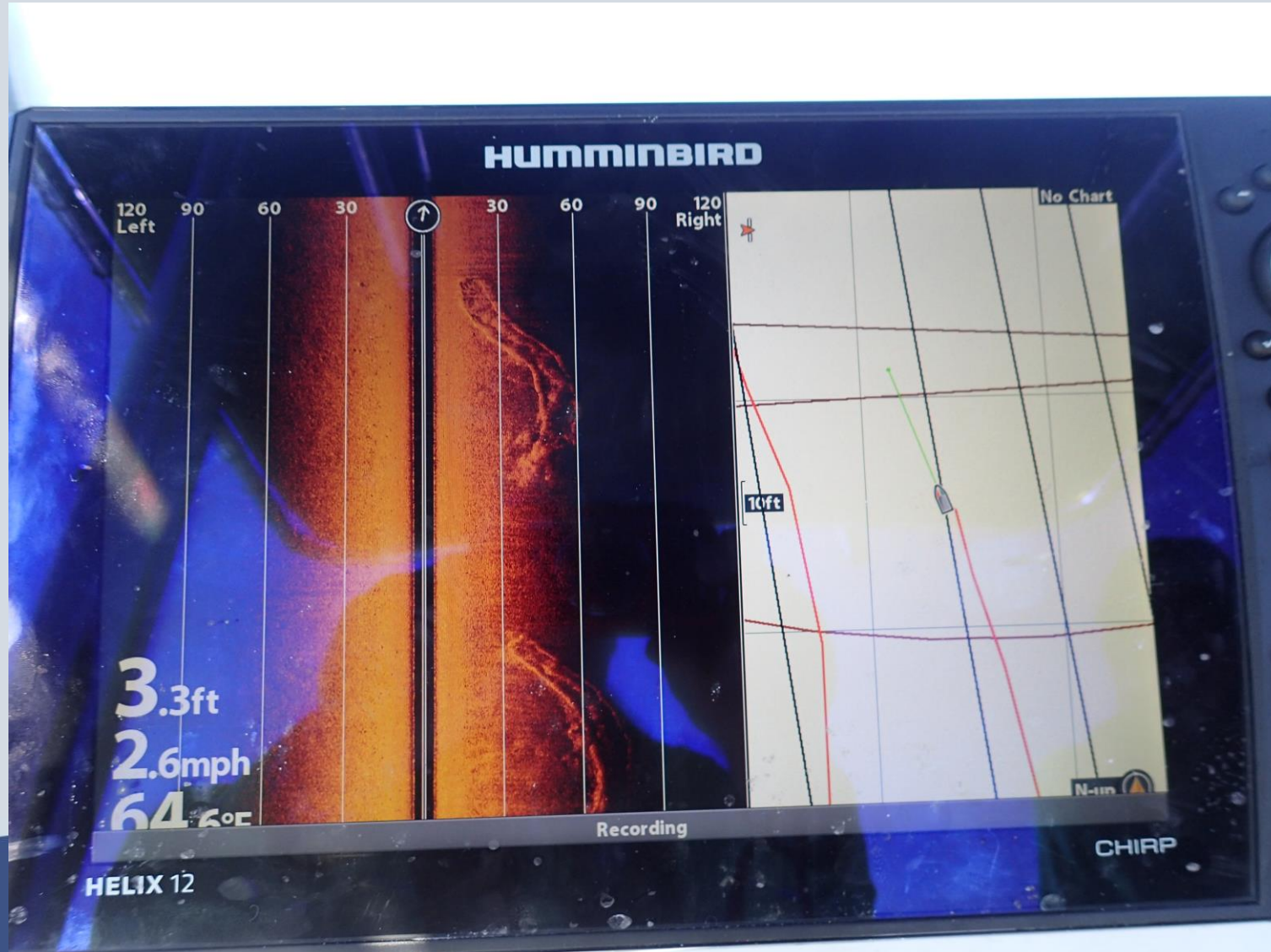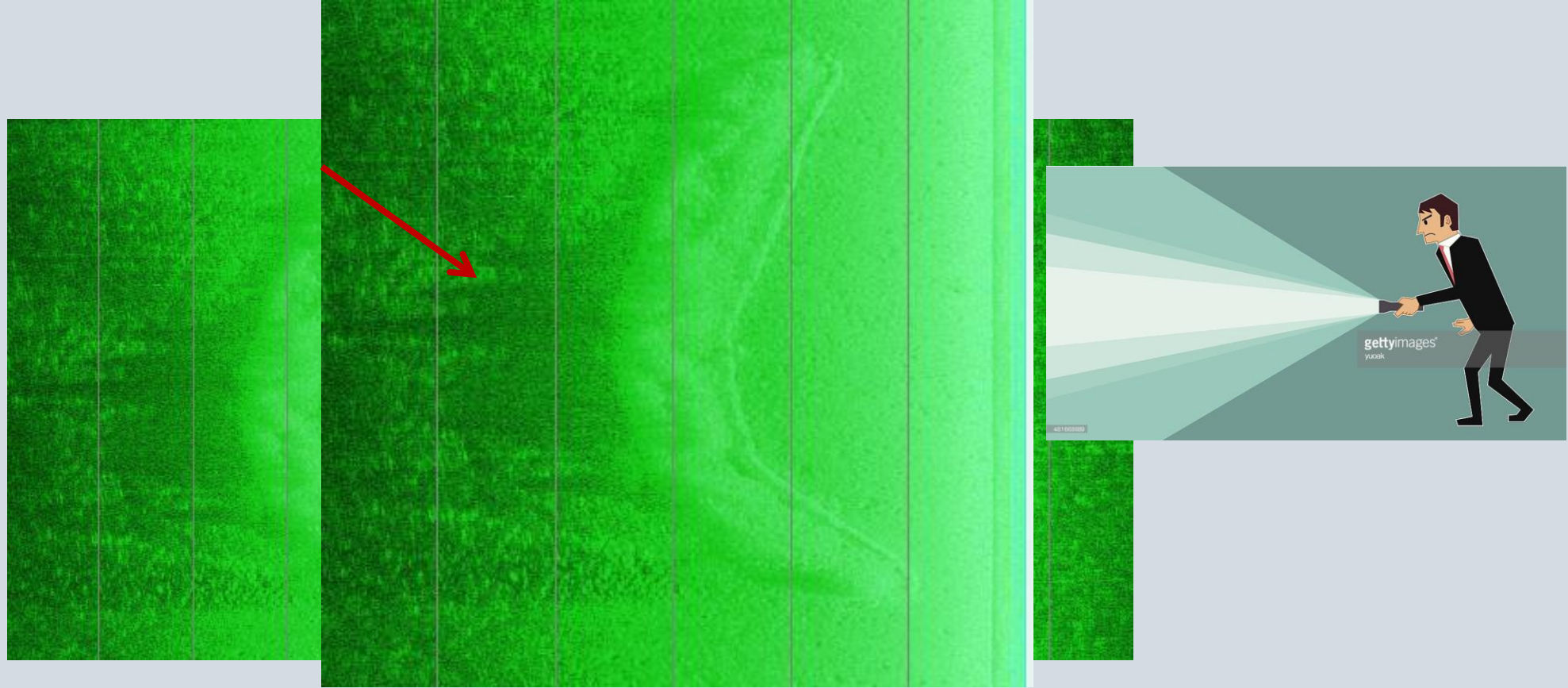
Side Scan Sonar Imagery (SI)

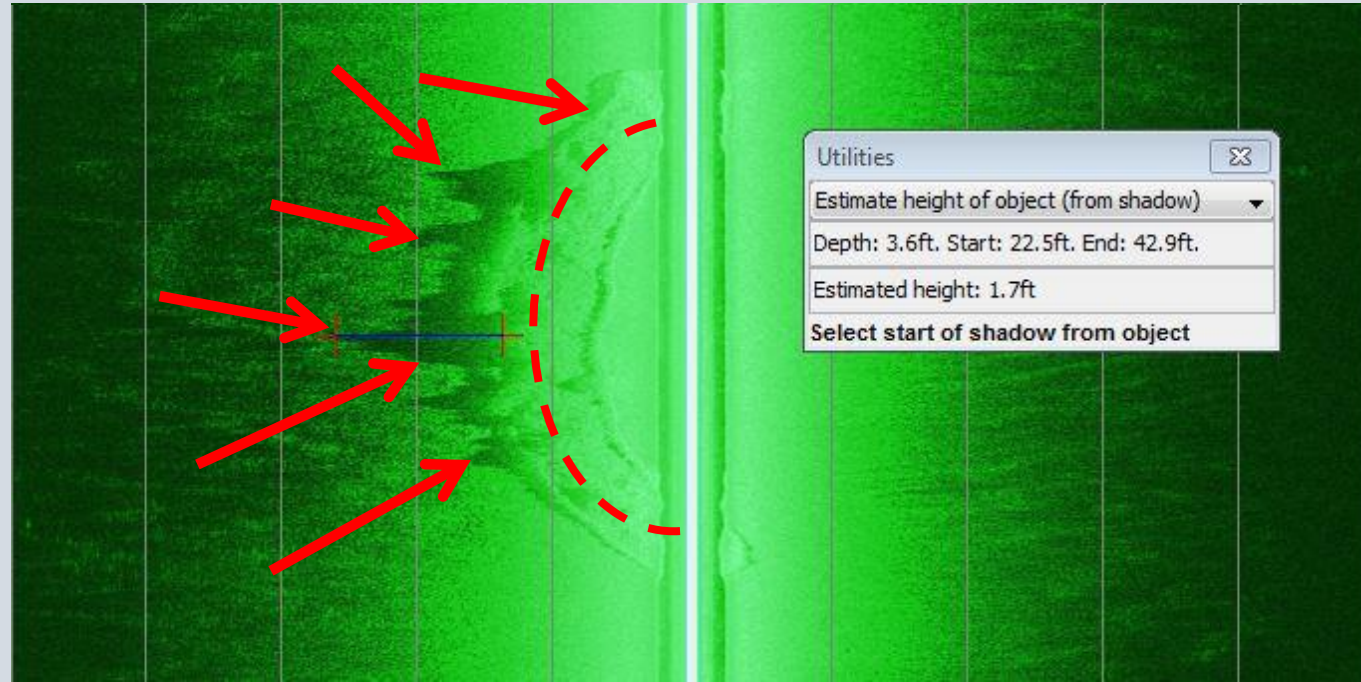- HumminBird Helix 12
  - CHIRP SI GPS

Side Scan Sonar Imagery (SI)

- Sends out sound waves at high frequency and interprets the returning echoes
- Like shining a flashlight on the bottom, but with sound
- Position of the "flashlight" related to the object determines shadow length
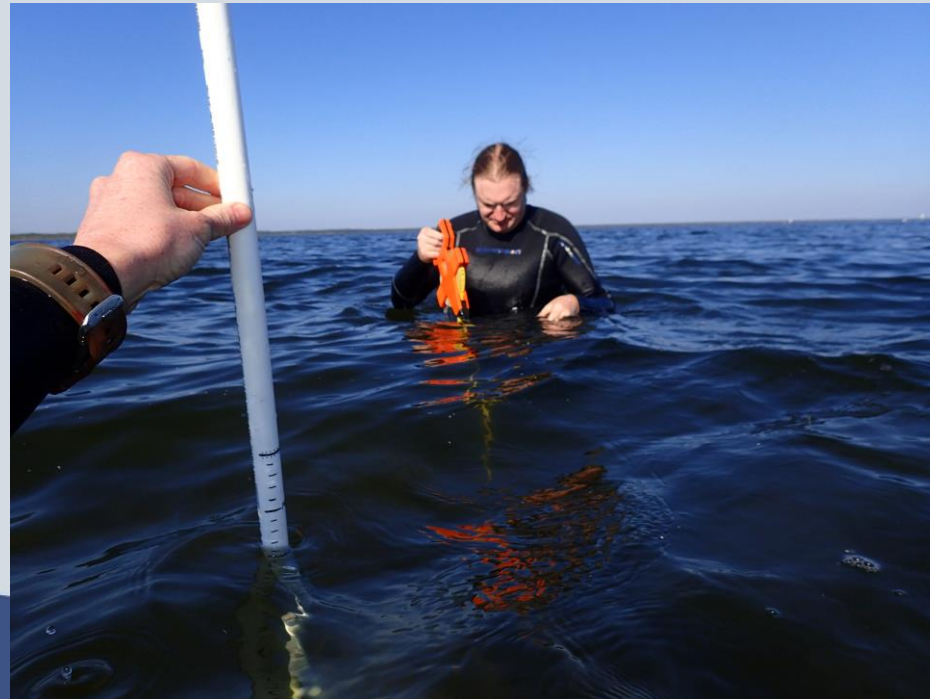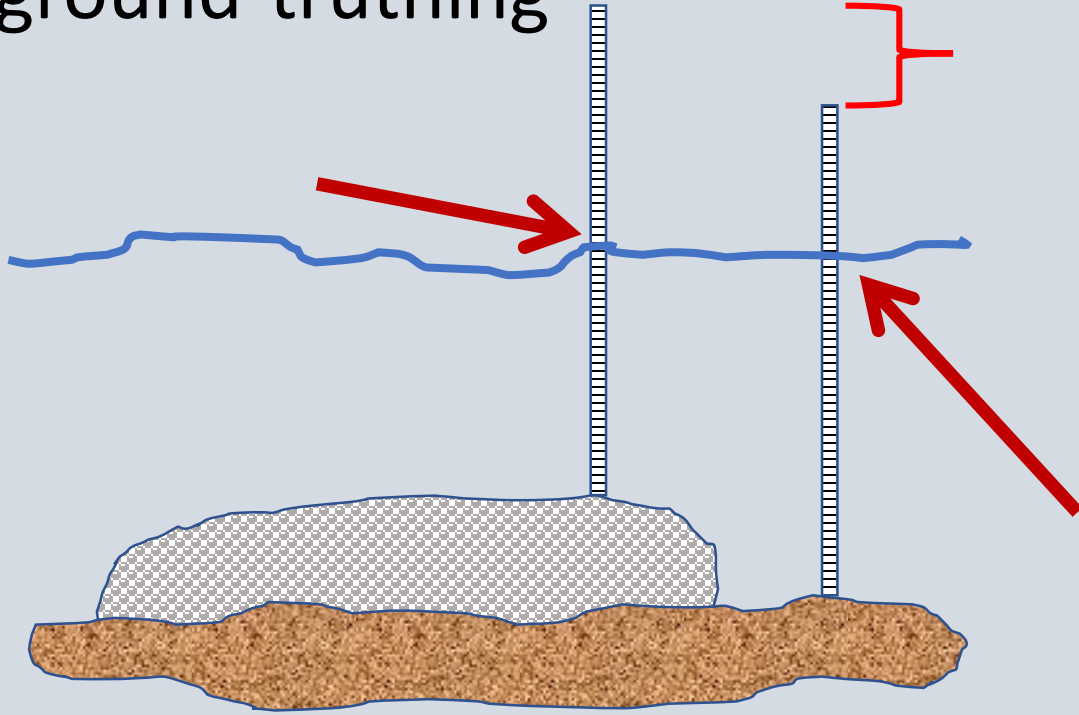
Estimating Reef Height

- Estimate height based on shadow length (HumViewer)
- Measure shadow length at regular intervals along the reef
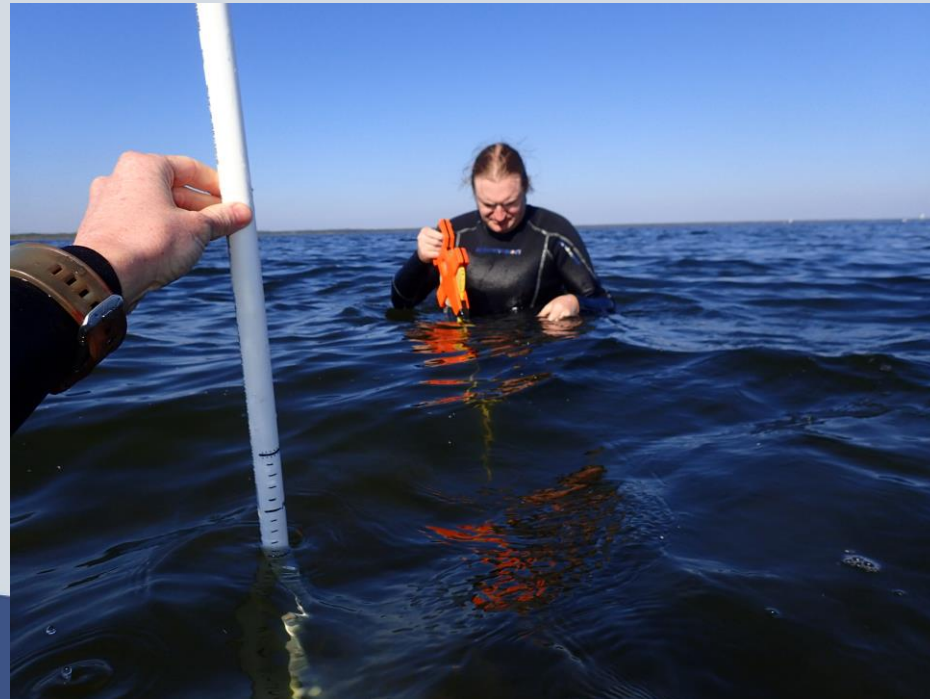- Determine maximum, minimum, average, etc.

How accurate is it?

- Compared to labor intensive ground-truthing

How accurate is it?

- Compared to labor intensive ground-truthing

- 67 reef samples to compare
  - Statistically significant difference between methods of ≈ 2 cm
  - Biologically significant? Not really…
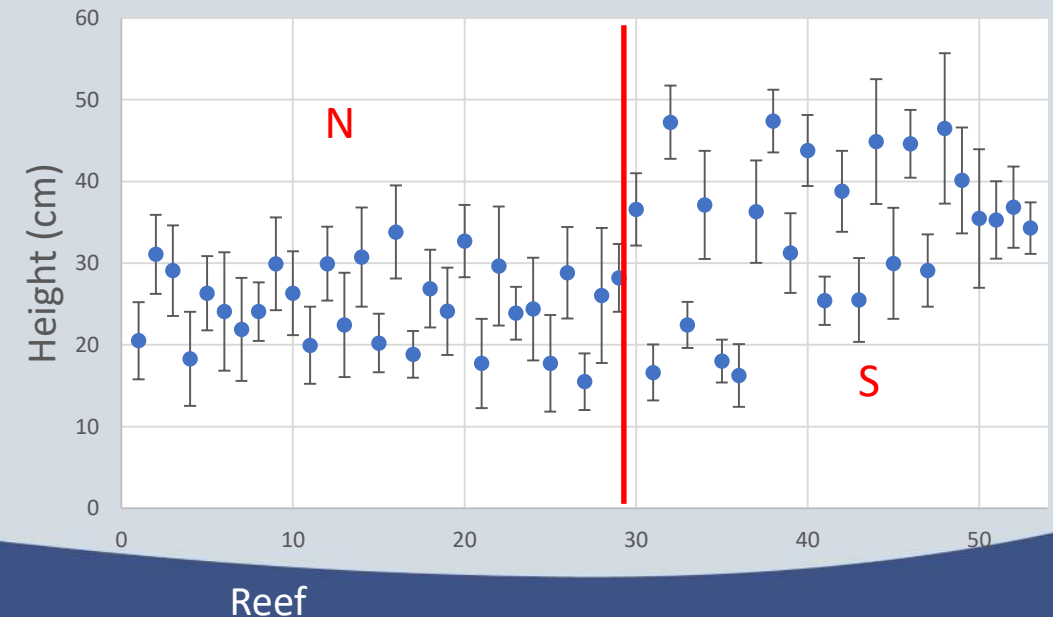 - Difference could result from user error with each method

How accurate is it?

- Phase I
  - Sonar caught a significant height decrease between 2016 and 2017
  - Ground-truthing didn't catch the difference
  - Sampled only 7 reefs

- Phase II (53 reefs)
  - Both methods caught the same differences in reef heights

Ground-Truthing
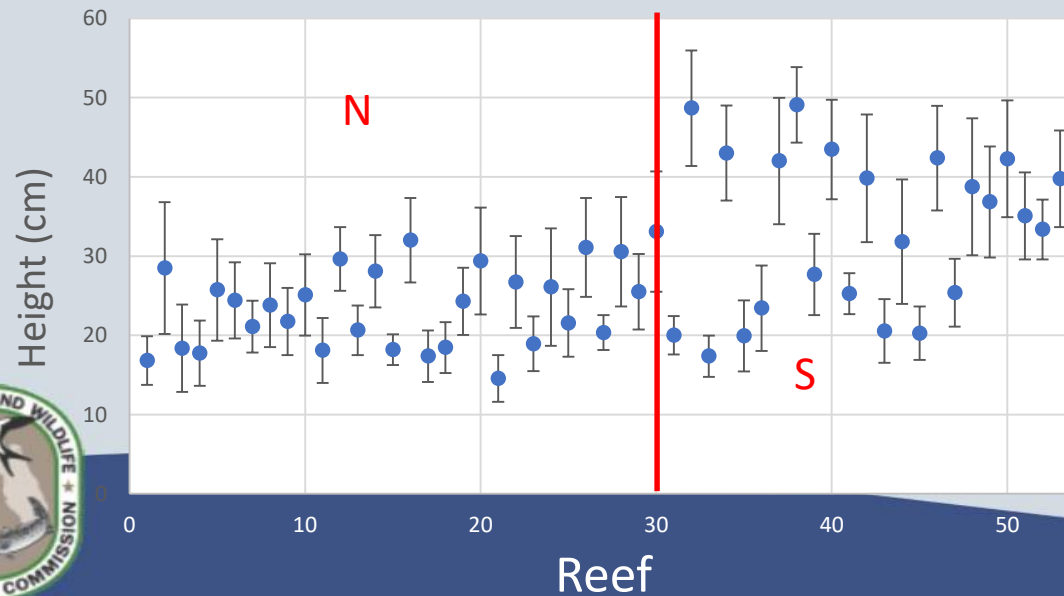
Side Scan Sonar

Silver Bullet?

Strengths

- Generates massive amounts of data quickly
- Requires much less man power
- Requires much less time
- Cheaper overall than in water methods
- Covers larger area with much less effort
- Water visibility isn't a factor

Weaknesses

- Ineffective at shallow depths
- Height doesn't work for low profile reefs
- Requires favorable weather conditions
- Operation requires training and experience
- Processing the data is very time consuming

Questions?

Jacob Berninger, M.S.

Jacob.Berninger@MyFWC.com

850-510-9036