

# Deployment of a Drifter Buoy in the Sudbury River: Prototype Design and Results

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# Introduction

- The purpose of this project was to find out the currents of the Sudbury river and Fairhaven bay.
- We chose to build a buoy/tracking device because we found this topic interesting and we thought that it might have a real use in the world.
- For example, it could measure how fast the current is moving or what type of material is in the water. Another use for this device could be to find seasonal changes in the river. You could maybe even find where certain life forms are, such as fish or invasive plants.

# Summary of Research

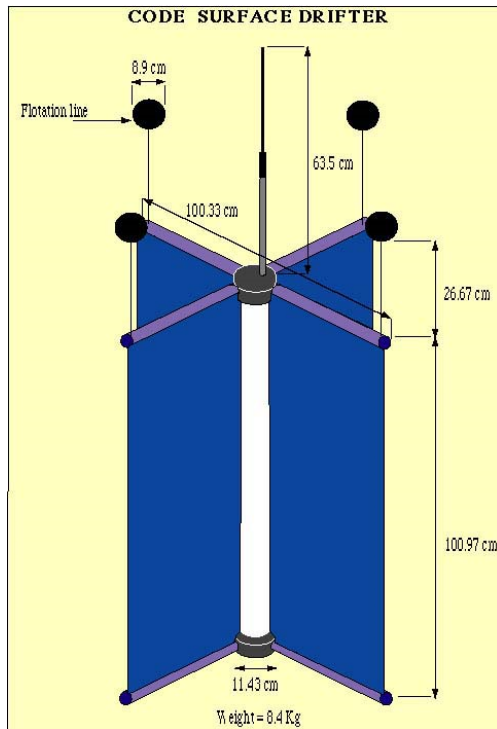
- There are thousands of drifter buoys in the oceans around the world.
- When we started to design our project, we researched other solutions to our problem.
- We found many design concepts but we obtained almost all of our ideas from two specific designs. Our design is an improved hybrid of other designs.
  - We found the idea to use a brick as a ballast and a life ring as flotation from a design made by a group of college students at the University of Texas as a homework assignment.
  - We adopted the idea of using fins and using the SPOT from CARTHE: Consortium for Advanced Research on Transport on Hydrocarbon in the Environment (a program led by the University of Miami).

# Summary of Research

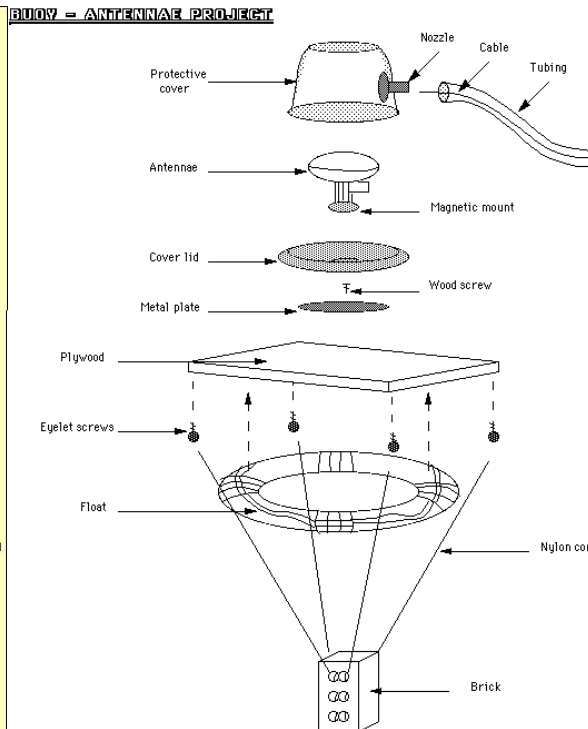
- We also contacted an expert in the field, the leader of CARTHE. He was very interested in the fact that we were doing a project on drifter buoys. He said in some of the emails “inspiring the younger generation is one of our ultimate objectives (I just did not expect it so fast!)” and “Please let me know if you have any other questions. I would be most happy to help out. It is great to learn that this has been inspiring for school students! :) This is not all that complicated and you can do it!” *This encouraged us.*

# Solutions

## Sources for Ideas for our Prototype



<http://tinyurl.com/7pgj8qy>



<http://tinyurl.com/c627kam>



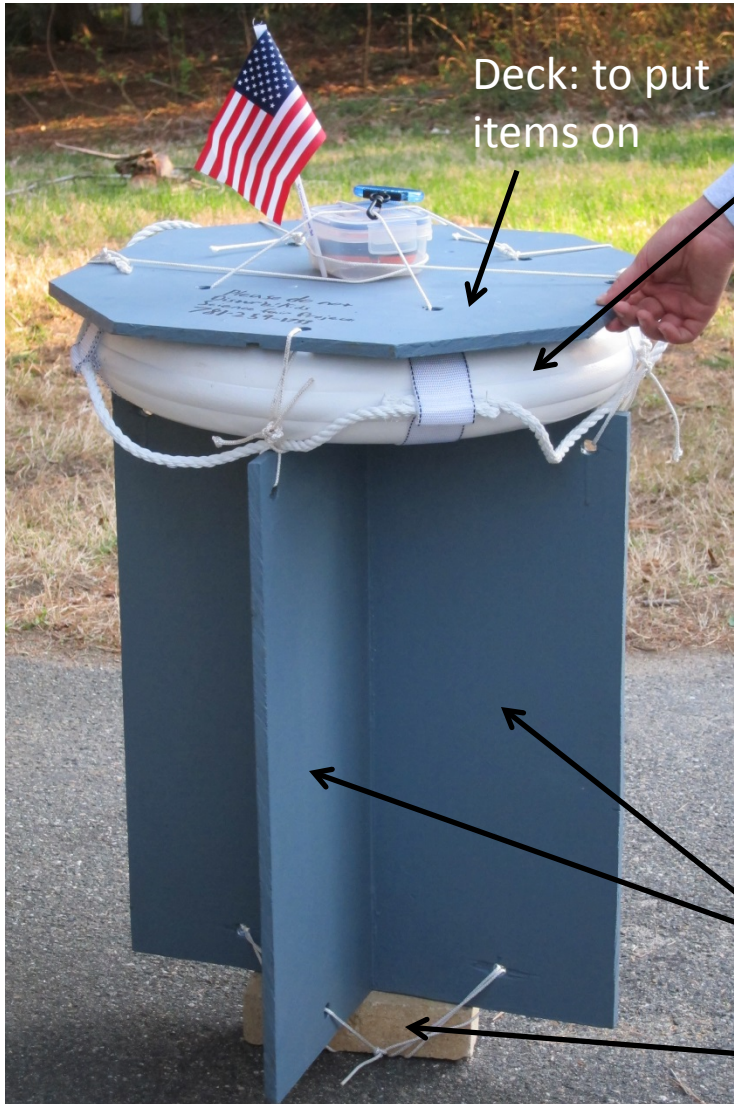
<http://tinyurl.com/c6wnbj8>



<http://carthe.org/glad/blog/?p=84>

- We adopted the idea of using fins from this common drifter buoy design
- We got the ideas of using the life ring, and the brick to use as a ballast from this design
- We got the idea of using the SPOT GPS from CARTHE

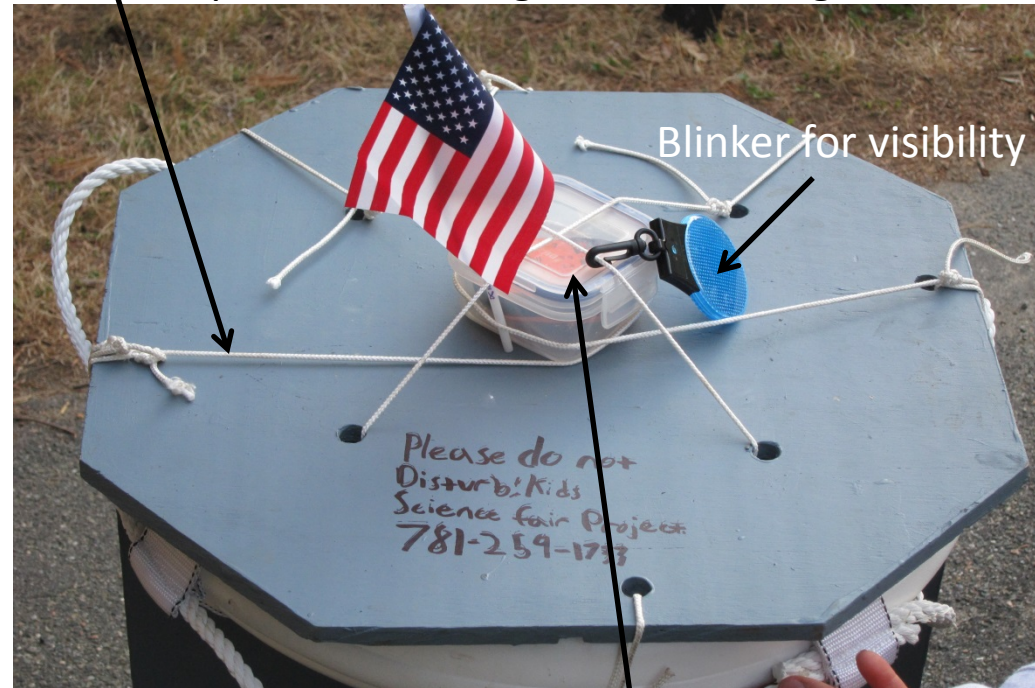
# Prototype Features



Deck: to put items on

Life ring: to provide floatation

Rope: to hold things down and together



Blinker for visibility

Fins for catching current

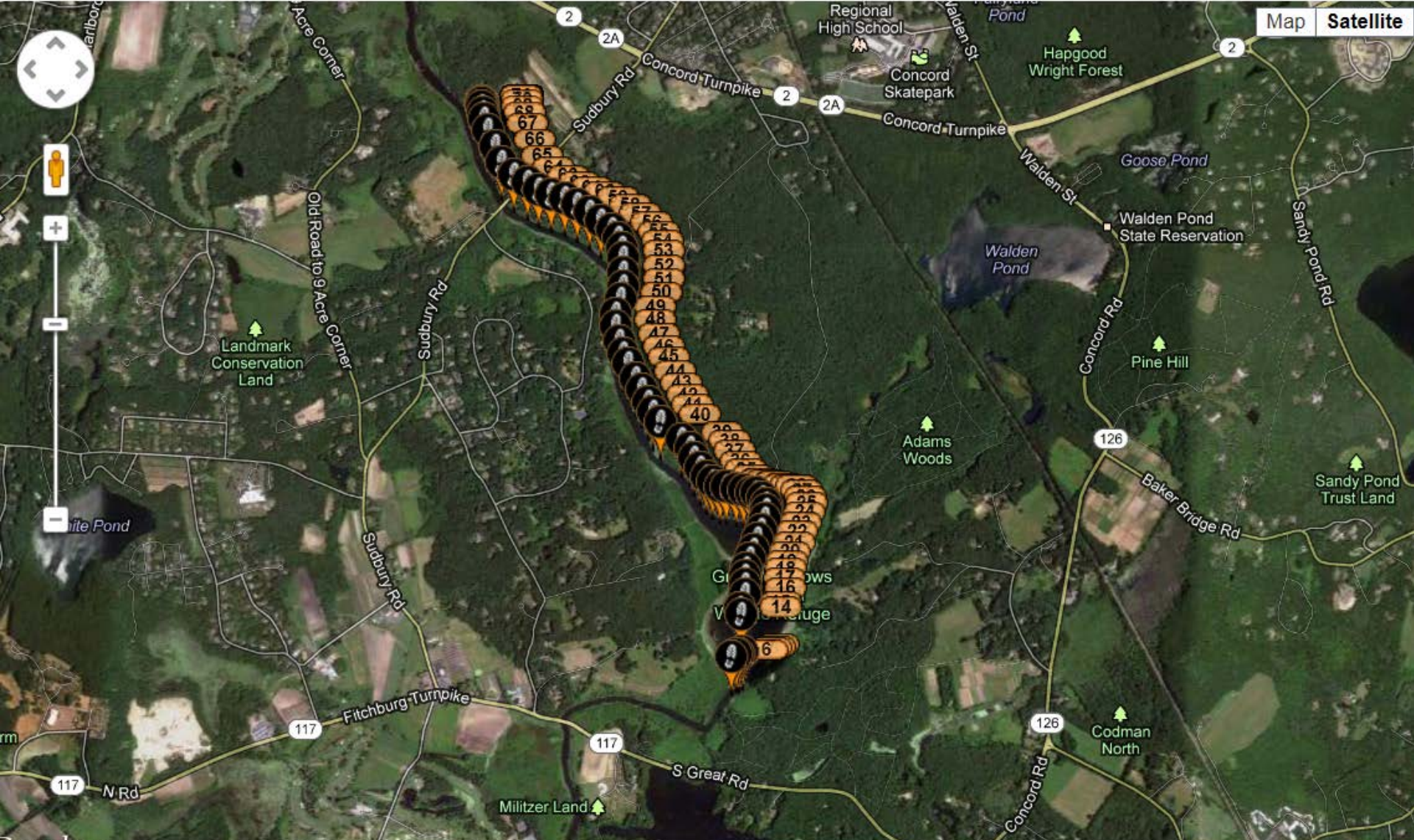
Brick for ballast

Waterproof box to keep SPOT GPS dry



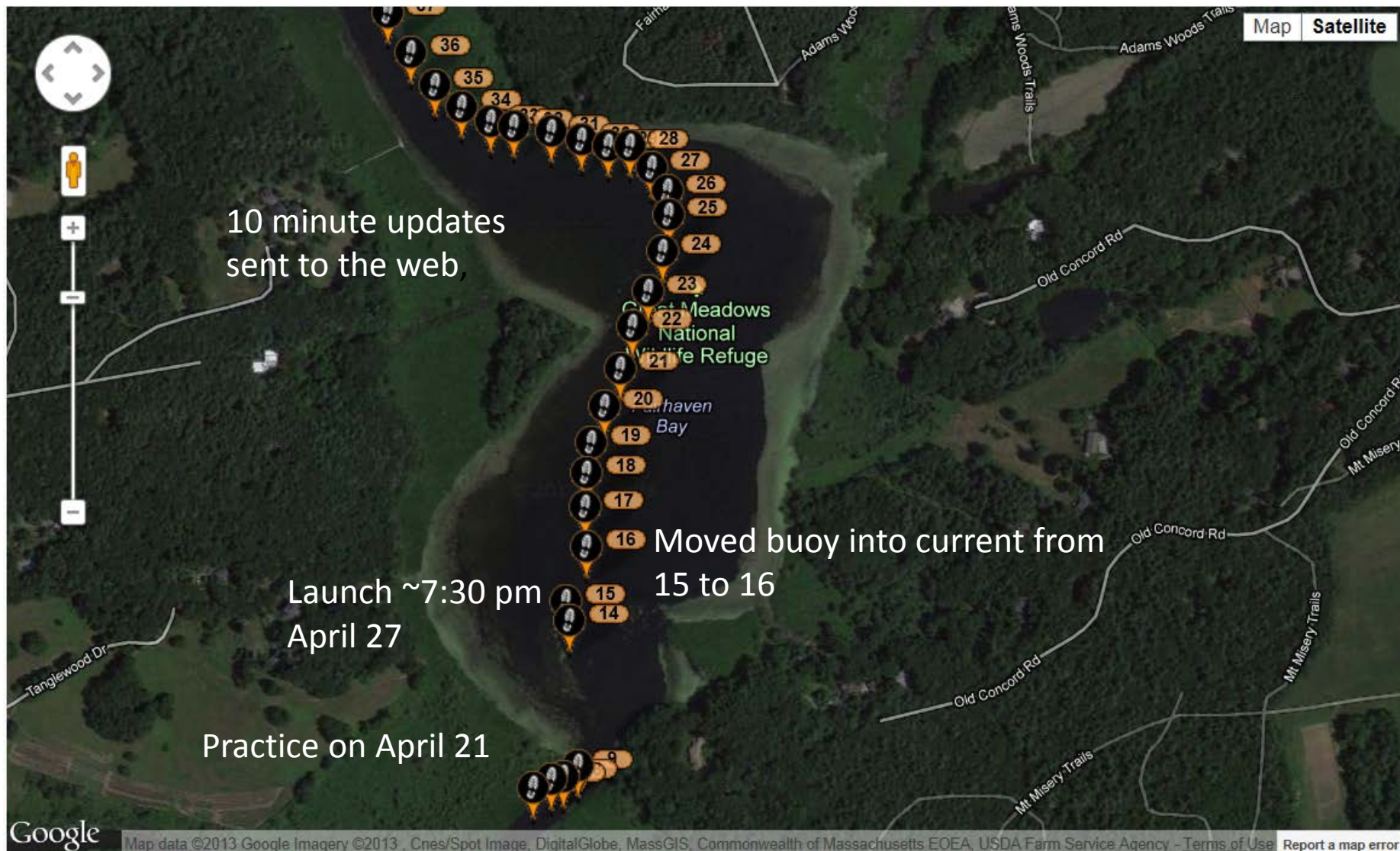
# Test Results

Collected on April 21, 27-28





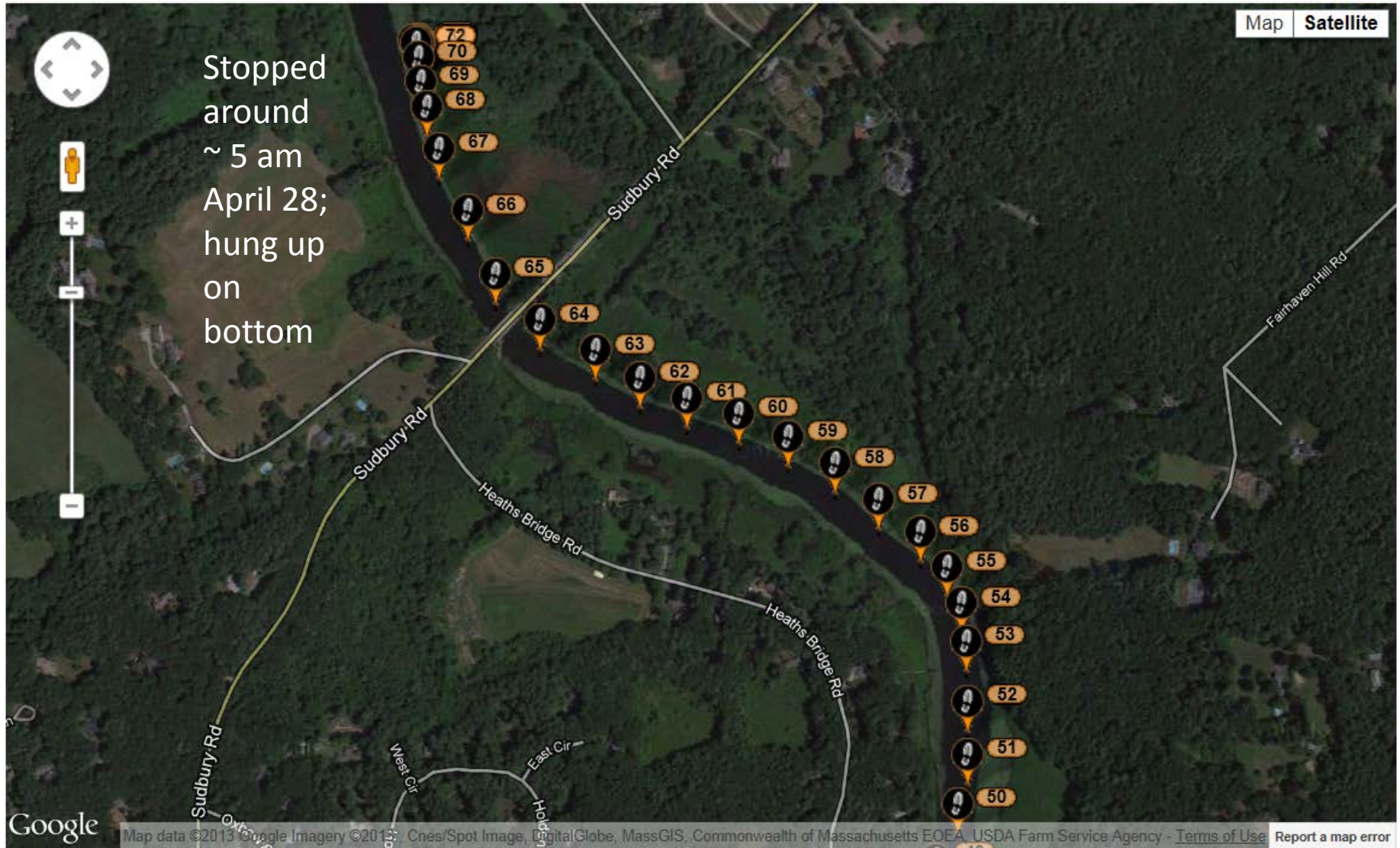
# Close up of Fairhaven Bay





# Close up of the Sudbury River

## End of collection



# Conclusion

## Engineering Design Process

Problem Definition: We wanted to determine the current(s) in the Sudbury river and Fairhaven Bay.

Background Research: We looked up other solutions and designs that other people already had built.

Requirement Specifications: We needed to make sure that the drifter buoy wouldn't tip over and if it did, it would be able to rebound back to where the GPS receiver was facing upwards. We needed to make sure that we could track the buoy. We also needed to make sure that it could both float and stay afloat.

Create Alternative Solution- We designed different prototypes that would fit our standards/criteria.

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# Conclusion

Choose best solution- We went with the most stable, easy to make idea/prototype.

Do development work- We tested if the GPS tracking device was working.

Build a prototype- We built our prototype.



# Conclusion

Test and redesign- We dropped the prototype in the water and we tested if it could float and if it could stay afloat, if the GPS receiver was working and if the current was taking the buoy along with it.

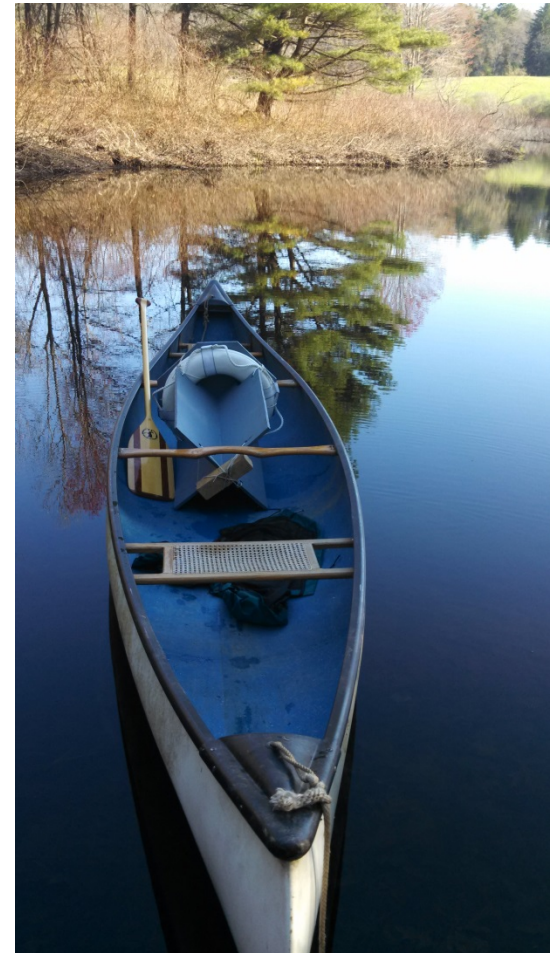
If we were to put it in the ocean, we would have to make it more seaworthy, more durable and sturdy. The results we achieved for this experiment were due to the current, which took the buoy downstream. Errors that may have affected the results include the possibility of a boater who made a wake or an animal that disturbed the buoy.

Project by: Harrison Reiter and Kevin Telfer

Acknowledgements:

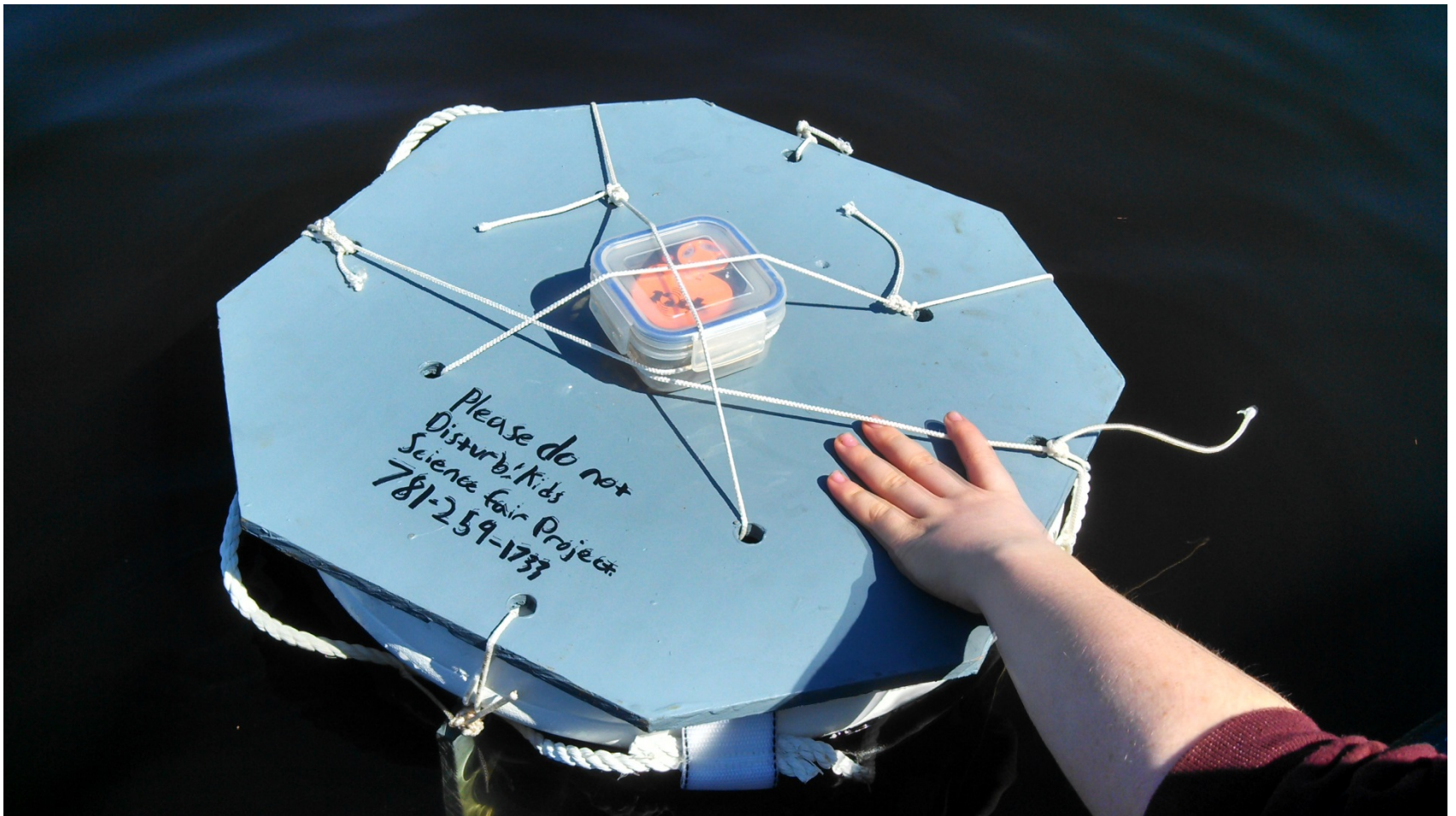
parent help with toxic glue and supervision

# Deployment by canoe





# First launch





# First launch





# Final launch -evening





# The Sudbury River - the next morning



# Final pickup- morning

