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- University of New Hampshire and Blue Water Concepts
- NARW Flipper – Vertical Line interaction testing
- Build on earlier efforts with the 'flipper' from 2007
- The 2007 testing was done with the flipper just below the surface, and with vertical lines with scope of approximately 4
- Results were reported to NEAq and at the N. Atlantic Right Whale meeting
- Subject moved to 'taut vertical lines'
- Deploying the flipper further below the vessel

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- Could this be done……
- Flipper deployment depth: 12 feet below the surface
- Required a new approach……
- More robust method of observation
- New list of parameters to consider

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- Parameters…..
- Line diameter
- Tension in the line……..
- Required a ‘larger mooring block’…..
- 1690 pounds in air, 1000 pounds in water
- Recall the flipper is approximately 500 pounds in air…..

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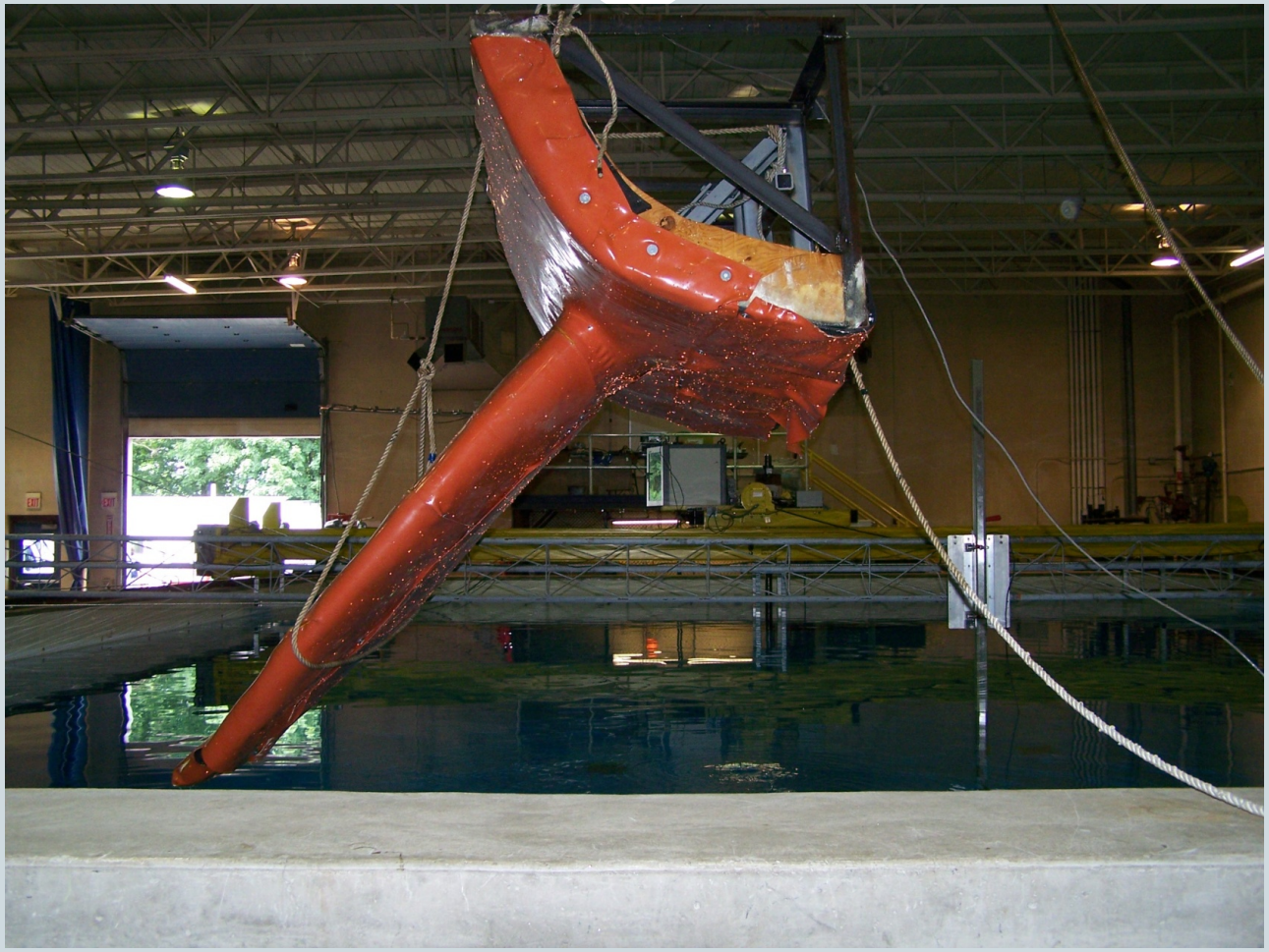

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- Attempted to make it lighter by eliminating the unnecessary structure….
- New ‘whale side’ was fabricated……
- Lighter frame for holding it to tow frame
- The flipper would be at 12’

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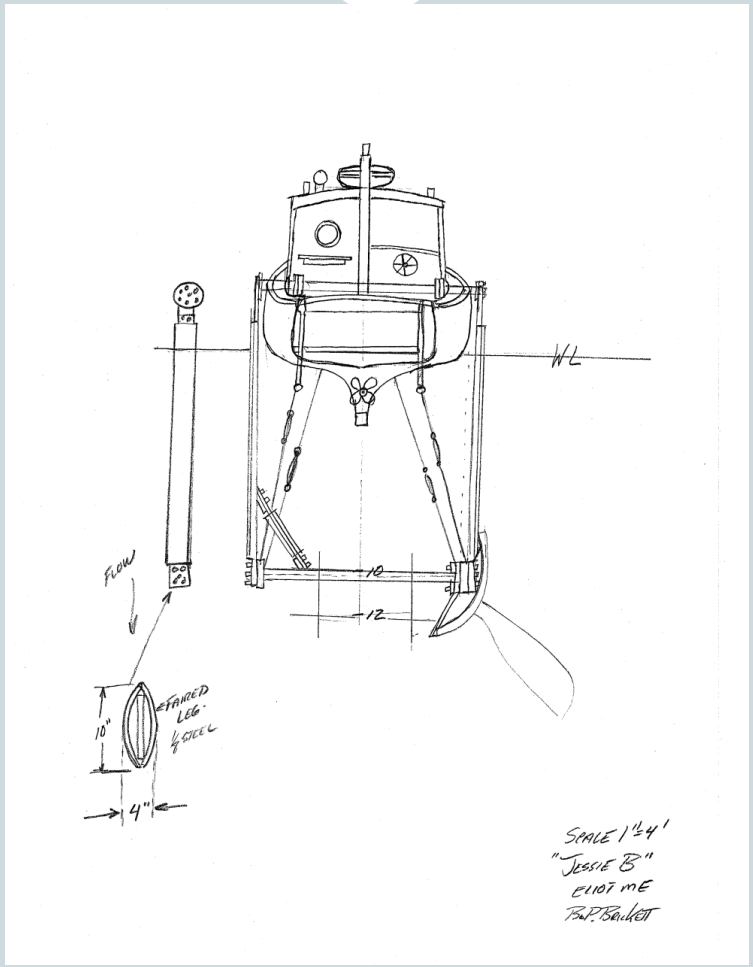

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- New frame for the *Jesse B* was ‘more complicated’
- Every component which could be fabricated from steel and ‘internally foamed’ was….
- The 12 foot long vertical member could float…….barely
- System was designed to distribute load to many places on the *Jesse B*

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- New flipper fabricated to reduce the weight
- Local boat builder…..used old flipper as a model for his mold
- Built two halves, strengthened them internally
- Fused the two together

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- Testing on 24 October 2010….
- Two cameras were deployed
- One looking forward so Ben can ‘see’ where he is going or where is the line….
- Second camera was mounted in the whale side and looking ‘down the flipper’
- Twelve video recordings were made

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- The mooring was fitted with 3/8 “ line
- It had been in the water for some time
- Water depth was 38 feet
- Boat speed approximately 2 knots
- The surface float was a 24” diameter poly-ball
- When fully submerged it would provide approximately 270 # of line tension

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- Movie time……the other computer
- No chance to edit or shorten the video
- The interaction of the flipper and the line is ….different than the previous testing
- There are a few of the older video clips available for comparison
- The line appears to exit the flipper quickly with little ‘snagging’

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- Summary:
- The field testing gear is set to go
- More testing will have to wait as the *Jesse B* had to be hauled today
- There are two more line diameters to test and different size floats
- Line tension vs. the tidal elevation will be assessed via measurement as a part of the final efforts

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- Numerical modeling work using the UNH AQUA-FE code is beginning
- The AQUA-FE code was developed to investigate dynamic loading on mooring lines used in aquaculture