- Project Goals, Proposed Approach and Schedule
- Budget (Labor and Dollars)
- Misc:
  - OMAE Paper
  - Liquid Robotics
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- Plate Concept Design
  - Design Goals
  - Concept Design and Analysis
  - Model Testing Options
  - Work Breakdown and allocations

Project Goals, Schedule, and Budget

- Increase System Reliability and Demonstrate a six month summertime deployment
- Proposed Approach
  - Plate Re-design
  - Buoy Re-design
  - Electronics Changes
  - PTO Improvements
- Schedule: In water by May 15th (Six months concludes then Nov 15th)
  - Deployment Strategy
- Budget (Project Number 901405)
  - SE: 156 Hours (rawa)
  - EE: 152 Hours (mcgill)
  - ME: 1972 Hours (Hamilton, Cazenave, Erickson)
  - ME Tech: 650 Hours
  - EE Tech: 96 Hours
  - Machinist: 440 Hours
  - Expenses: ($73,250) (4 Shana Rae Days, @2400 in outside services and $62850 in parts)

    ($305.95 spent so far)

<u>Plate Concept Design</u>

- Design Goals
    - Manage the peak tensions in the system.
    - General stability. Current system has exhibited a lot of swinging and “maple leaf” behaviors.
    - Slack cable conditions. Reduce
    - Reliability.   We’ve had a lot of problems with the bridle tethers breaking, we could probably address this by just making them super strong, but it would be nice to also reduce the conditions that are causing the apparently high peak loads in that part of the system.

Model Testing Options

It isn't possible to scale this down and test in the test tank and get perfectly comparable results.

But, some testing is possible within the following limits.

- **"Prescribed motion" testing** can be done by scaling the system down and moving it faster by the same scale factor. **i.e. ½ size model, twice the speed**. (Reynolds number scaling) In our case the problem as the scale goes down is the required speeds will become hard to realize.
- **Dynamic testing (modeling how it moves and flops around)** can't be done perfectly at a scaled down size. For this type of test, the quantity U/sqrt(grav*L) must remain constant. (Froude number scaling). So the model test speed must be reduced by a factor equal to the square root of the scale factor**. i.e. ¼ size model, test at half the speed**.

Suggested test-tank tests.

- Full scale version of two flaps. Allows us to measure force and deflection angle versus speed, calibrate the springs, etc.
- ¼ scale version of entire system to estimate how it moves around under-water.
  - mass needs to be ¼ scale and distributed the similarly. i.e. same materials scaled down.
  - Springs need to be 1/256 as stiff. This means any friction in the model is exaggerated.