Pop-Up Major Lessons Learned   
from Gen 2

# Lessons Learned from Gen 2

-Major operational limitation was 170 day limit on burn wire release

-New burn wire developed by DBV Technology

- Higher load limit reduces need for a load reducing mechanism; cost savings from machined parts is equivalent to the additional cost of improved burn wire mechanism

-Pressure Data from Gen 2 showed that 10 bar and 3 bar pressure sensors were always within 2 cm of each other

-3 bar pressure sensor not needed – removed entirely from Gen 3

-Buoys ascended at approximately 1m/s when profiling with minimum buoyancy required for successful data transmission

\*\*Sea anchor likely needed to be added to slow buoy during ascent-not yet tested or integrated

-Temperature Probe changed to thinner style to reduce ‘temperature lag’ when profiling. Small hole also drilled in side of end cap to improve water flow past probe tip when profiling

-Sea Surface Temperature (SST) could be very desirable and allow for possible funding from NWS because buoys surface at times and locations with very few SST reporting stations. Buoys also worked remarkably well in moderate to high sea state (25-30 kts, 5-8 ft seas)

-SST Probe added to bottom of float

\*\*SST reporting requirements should be investigated and collaboration with NWS should take place to acquire possible funding

-Large number of machined parts (17) added undesirable costs to production

-Number of machined parts reduced from 17 to 8 in favor of off the shelf components and simpler components (such as PCB Mount)

-Temp, Depth, and PAR Data looked great, but more sensors needed for science purposes

-Integrated optional fluorometer

-Integrated small camera for situational awareness

\*\*Cost of fluorometer is still quite high (~$1,500). Opportunities should be explored in the future for developing a low-cost fluorometer

-GPS time comparison showed very little drift in buoys internal clocks (<<1 minute in 6 months).

-Time very reliable for synchronizing with any independent release mechanism

-Main draw on power budget was searching for GPS fix (~60% of total power budget in worst case scenario)

-Software changed to search for a single GPS satellite instead of a full fix (requires only a few seconds vs. several minutes)