Aquarius validation with Argo and HYCOM V3.0 and V3.4

3/31/2015
Figure 1.
Global maps of SSS differences as defined by the Aquarius V3.0 (top) and V3.4 (bottom) data minus the co-located buoy data.
Global maps of SSS differences as defined by the Aquarius V3.4 ascending (top) and descending (bottom) data minus the co-located buoy data.
Global maps of SSS differences as defined by the Aquarius V3.4 *ascending* (*top*) and *descending* (*bottom*) data minus the co-located buoy data.
Histograms for Aquarius – buoy differences, V3.0 (top), V3.4 (bottom).

V3.0

- Beam 1:
  - Median: -0.02
  - Mean: 0.01
  - STD: 0.38

- Beam 2:
  - Median: -0.02
  - Mean: 0.01
  - STD: 0.39

- Beam 3:
  - Median: -0.01
  - Mean: 0.02
  - STD: 0.41

V3.4

- Beam 1:
  - Median: -0.01
  - Mean: 0.00
  - STD: 0.33

- Beam 2:
  - Median: -0.02
  - Mean: -0.01
  - STD: 0.35

- Beam 3:
  - Median: -0.02
  - Mean: -0.03
  - STD: 0.43
Co-located difference histograms for each beam and Aquarius V3.0 data. (top) Aquarius – *in situ*, (middle) HYCOM – *in situ*, (bottom) Aquarius – HYCOM.

\[ \text{RMSD} = \sqrt{\text{Bias}^2 + \text{STD}^2} \]

\[ \text{dSSS V3.0} \quad 9/1/2011 - 3/31/2014 \]
Co-located difference histograms for each beam and Aquarius V3.4 data. (top) Aquarius – *in situ*, (middle) HYCOM – *in situ*, (bottom) Aquarius – HYCOM.

**Aq – *in situ***

**dSSS V3.4**  
9/1/2011 – 1/31/2015

**HYCOM – *in situ***

**RMSD = sqrt(Bias^2 + STD^2)**

**Aq – HYCOM**
Daily global average Aquarius-buoy difference time series, V3.0 (left) and V3.4 (right).
36-month average Ascending – Descending V3.0 data.
41-month average Ascending – Descending V3.4.0 data.
SEP/2011-Jan/2015
Daily average ascending and descending Aquarius – buoy difference time series, V3.0 data.
Daily average ascending and descending Aquarius – buoy difference time series, V3.4 data.

Negative bias
Daily median of global ascending minus descending SSS
Aquarius co-located buoy differences by latitude bands

The latitudinal biases have been reduced, but the STD is increased around 5S.
Aquarius co-located buoy differences by latitude bands

V2.0
- ascending + descending
- ascending
- descending

V3.4
- ascending + descending
- ascending
- descending
Co-located salinity differences between HYCOM and buoys for ascending (top) and descending (bottom) passes.