An evaluation of V3.4 SSS
Based on comparisons with V2.0, V3.0, and Argo

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Outline

- Compare L-3 monthly Aquarius data (V2.0, V3.0, V3.0 with post-hoc bias adjustment, and V3.4) with monthly OI maps of 5-m SSS based on Argo (from APDRC).

- Mean bias maps and histogram.

- Standard deviation relative to Argo (without the respective time mean).

- r.m.s. difference from Argo (including the respective time mean).

- Summary of globally averaged statistics for global & regional bias, std. dev., and r.m.s.

- Time-mean meridional gradient of SSS in the tropical Pacific & Atlantic.

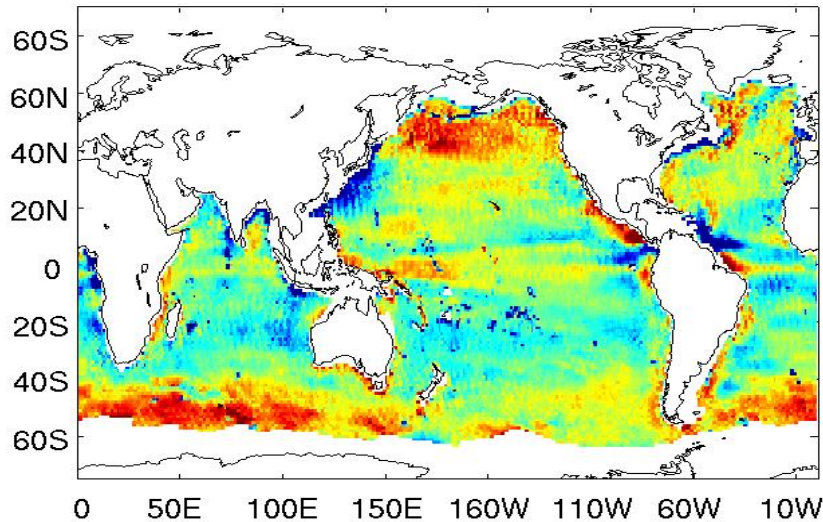# Mean bias of Aquarius SSS relative to Argo/APDRC 5-m salinity
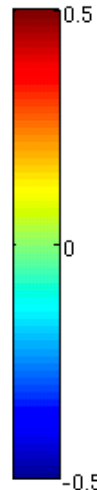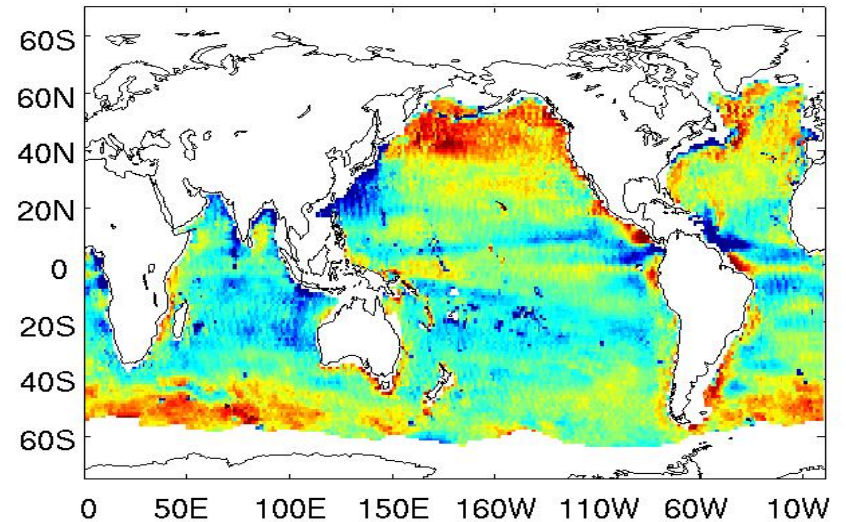during 2012-2013
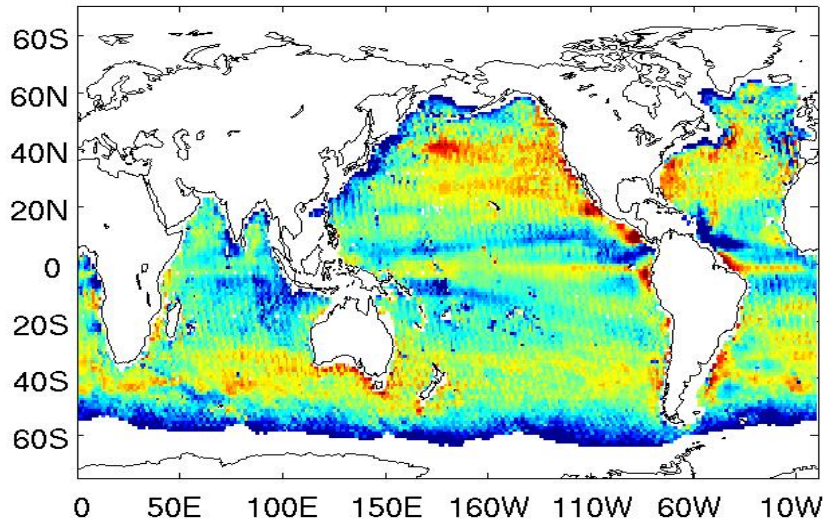
(a) V2.0-Argo/APDRC
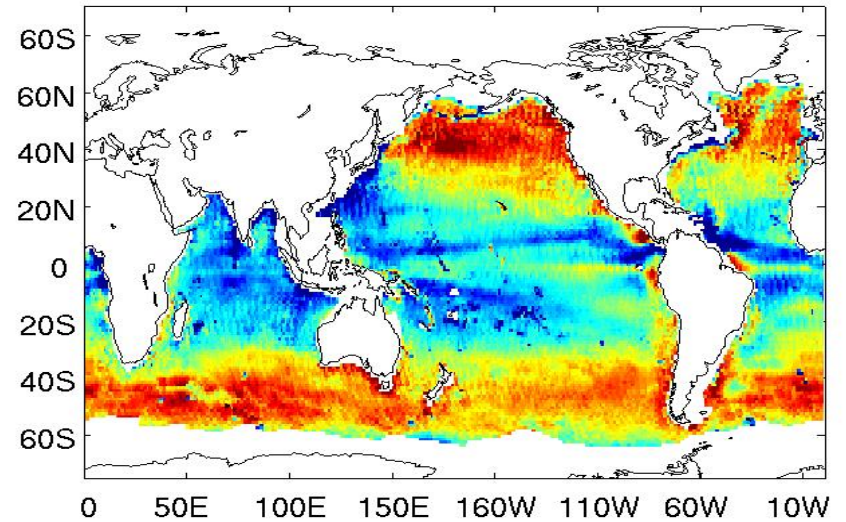
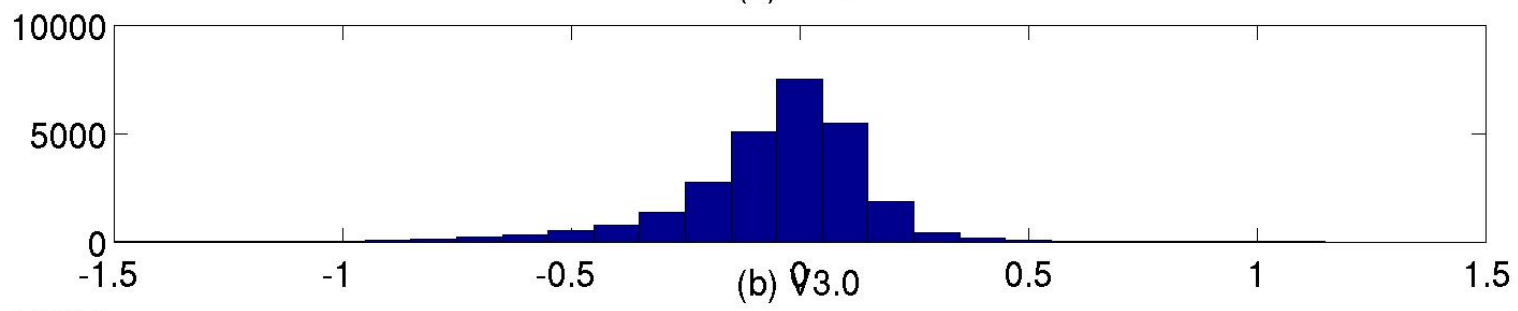(b) V3.0-Argo/APDRC

(c) V3.0 adj-Argo/APDRC

(d) V3.4-Argo/APDRC

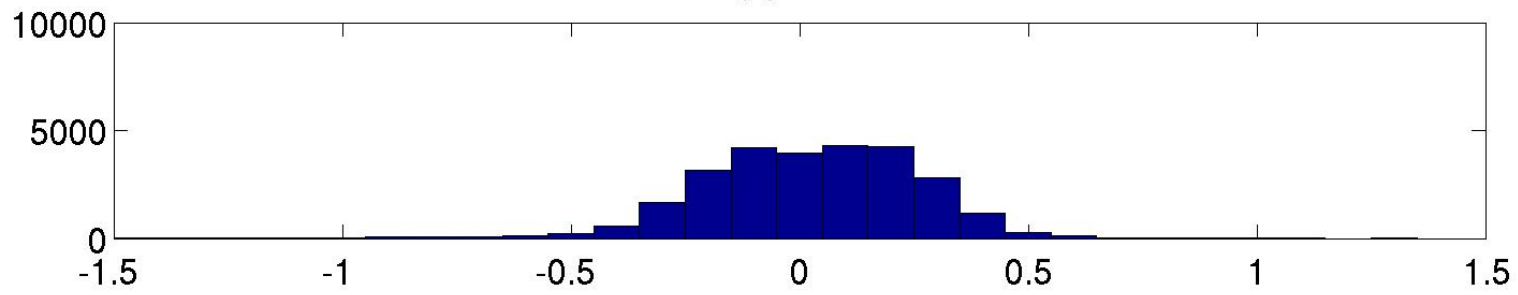# Histogram of mean bias of Aquarius SSS relative to Argo/APDRC 5-m salinity
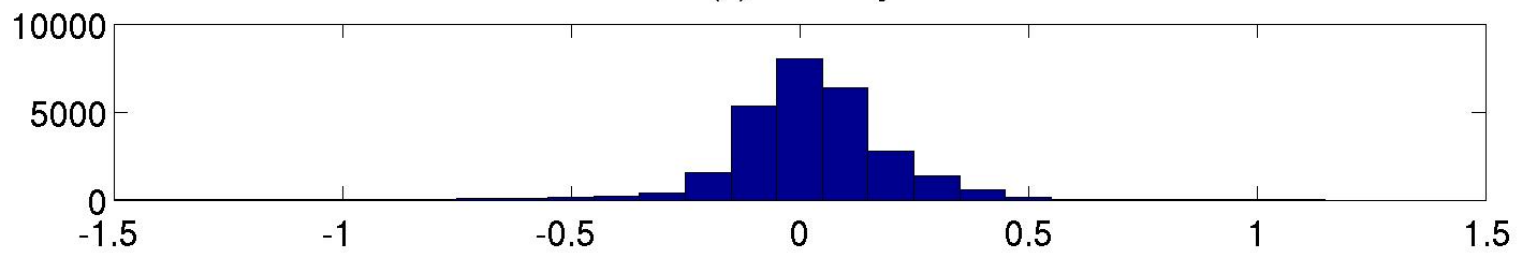## during 2012-2013
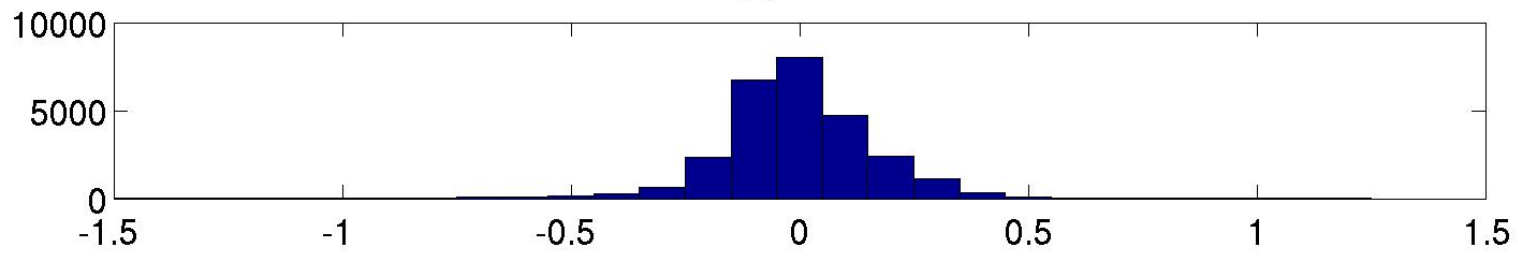
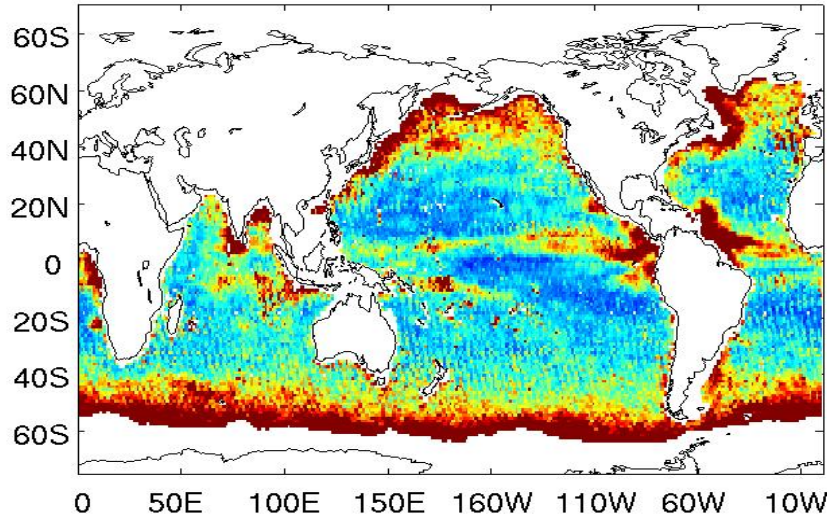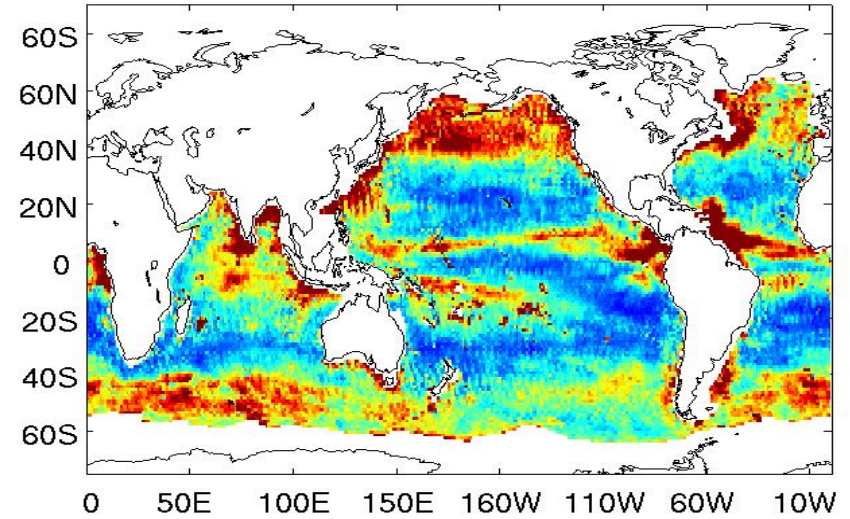# r.m.s. difference of Aquarius SSS w.r.t. Argo/APDRC 5-m salinity
during 2012-2013

(a) V2.0-Argo/APDRC

(b) V3.0-Argo/APDRC

(c) V3.0 adj-Argo/APDRC

(d) V3.4-Argo/APDRC

Std. Dev. of Aquarius SSS w.r.t. Argo/APDRC 5-m salinity
during 2012-2013
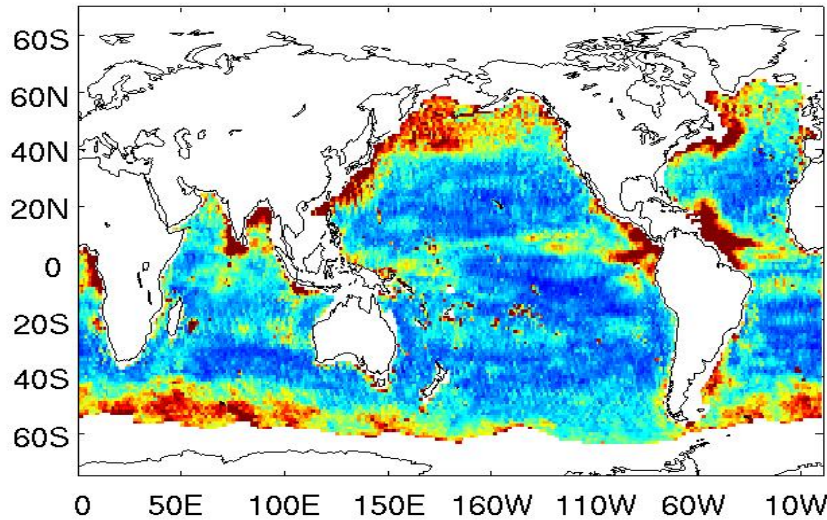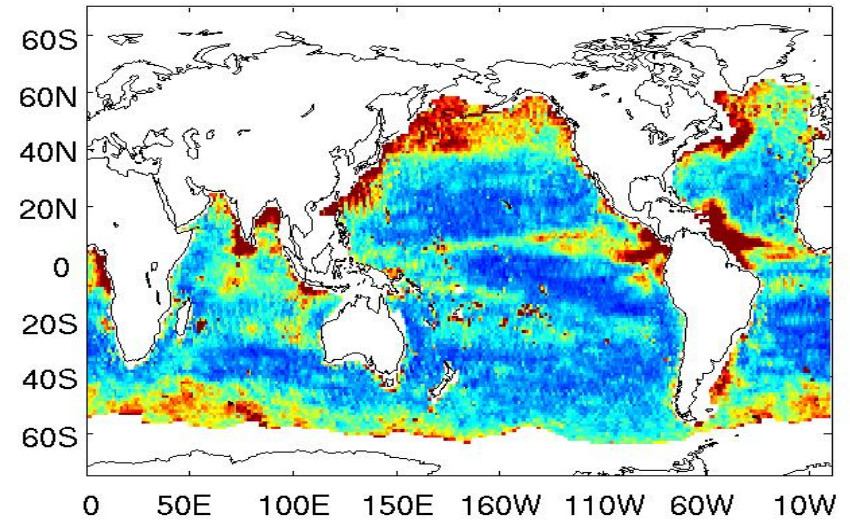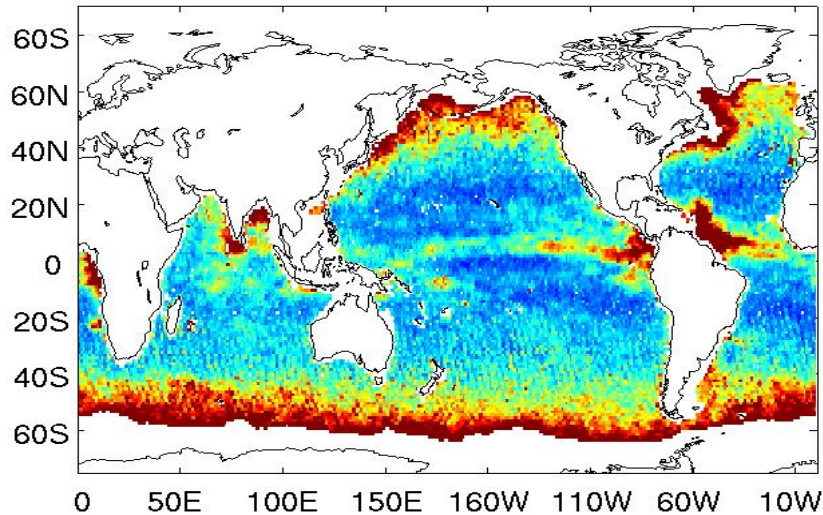

(a) V2.0-Argo/APDRC
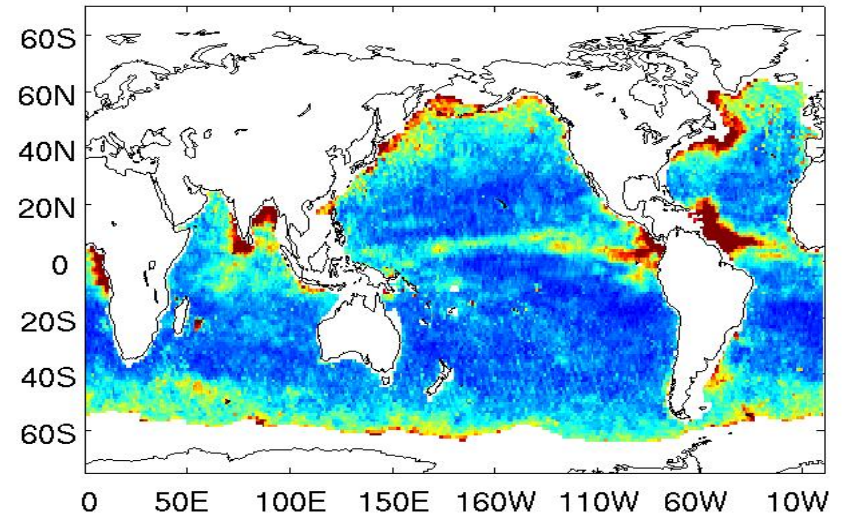
(b) V3.0-Argo/APDRC
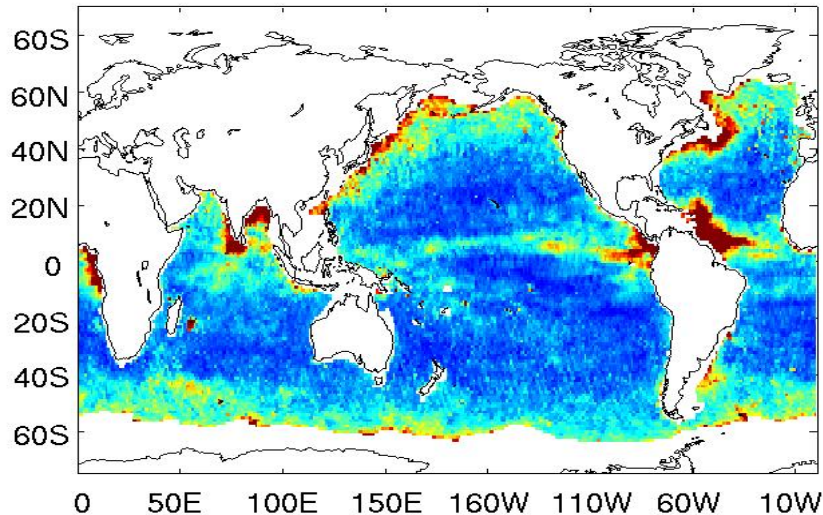
(c) V3.0 adj-Argo/APDRC
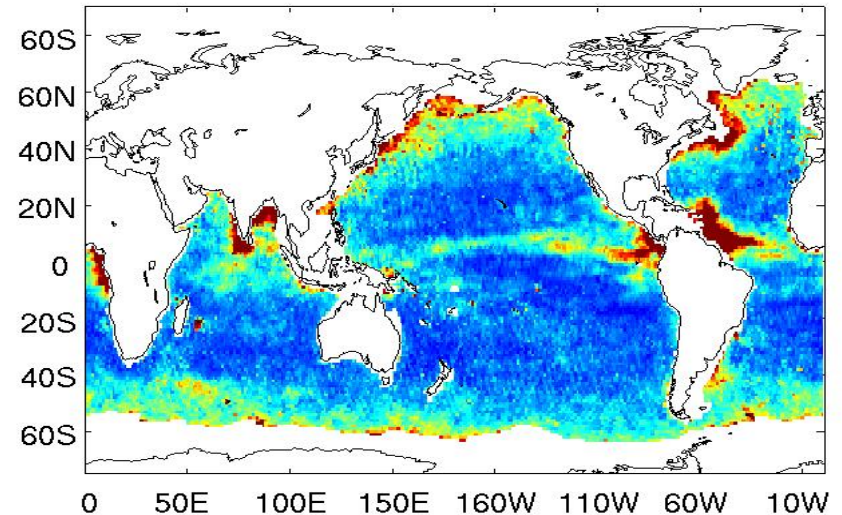
(d) V3.4-Argo/APDRC

Global area-weighted average statistics: Aquarius relative to Argo/APDRC

	V2.0	V3.0	V3.0 adj	V3.4
Global mean bias	-0.052	-0.009	0.005	-0.026
Averaged regional absolute time-mean bias	0.14	0.19	0.13	0.13
Averaged std. dev.	0.24	0.18	0.17	0.17
Averaged r.m.s. diff.	0.29	0.27	0.23	0.23

Time mean N-S gradient of SSS (during 08/2011-04/2014), Pacific

Meridional gradient of SSS, Pacific, 160W-95W average
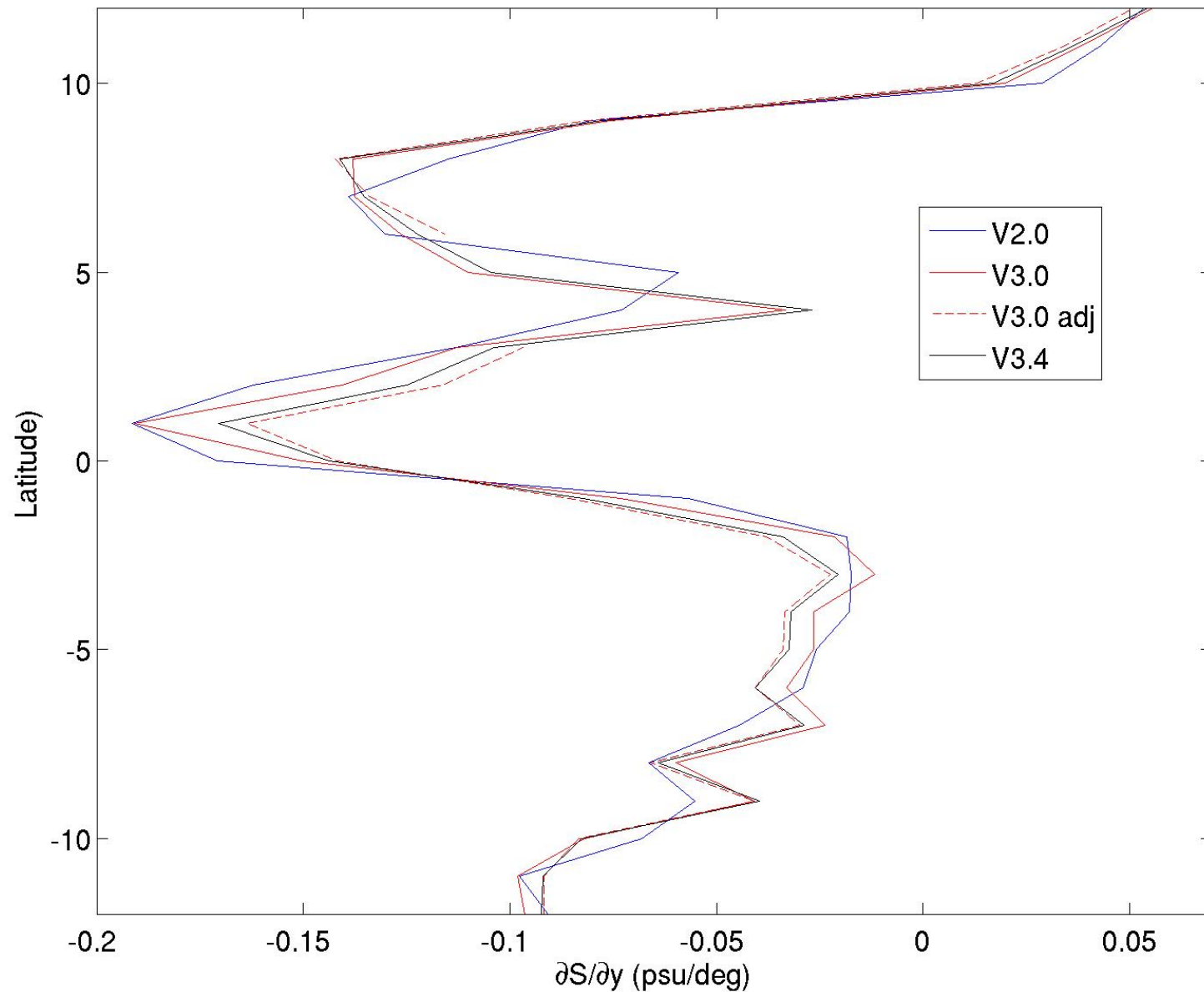
Time mean N-S gradient of SSS (during 08/2011-04/2014), Atlantic

Meridional gradient of SSS, Atlantic, 40W-10W average
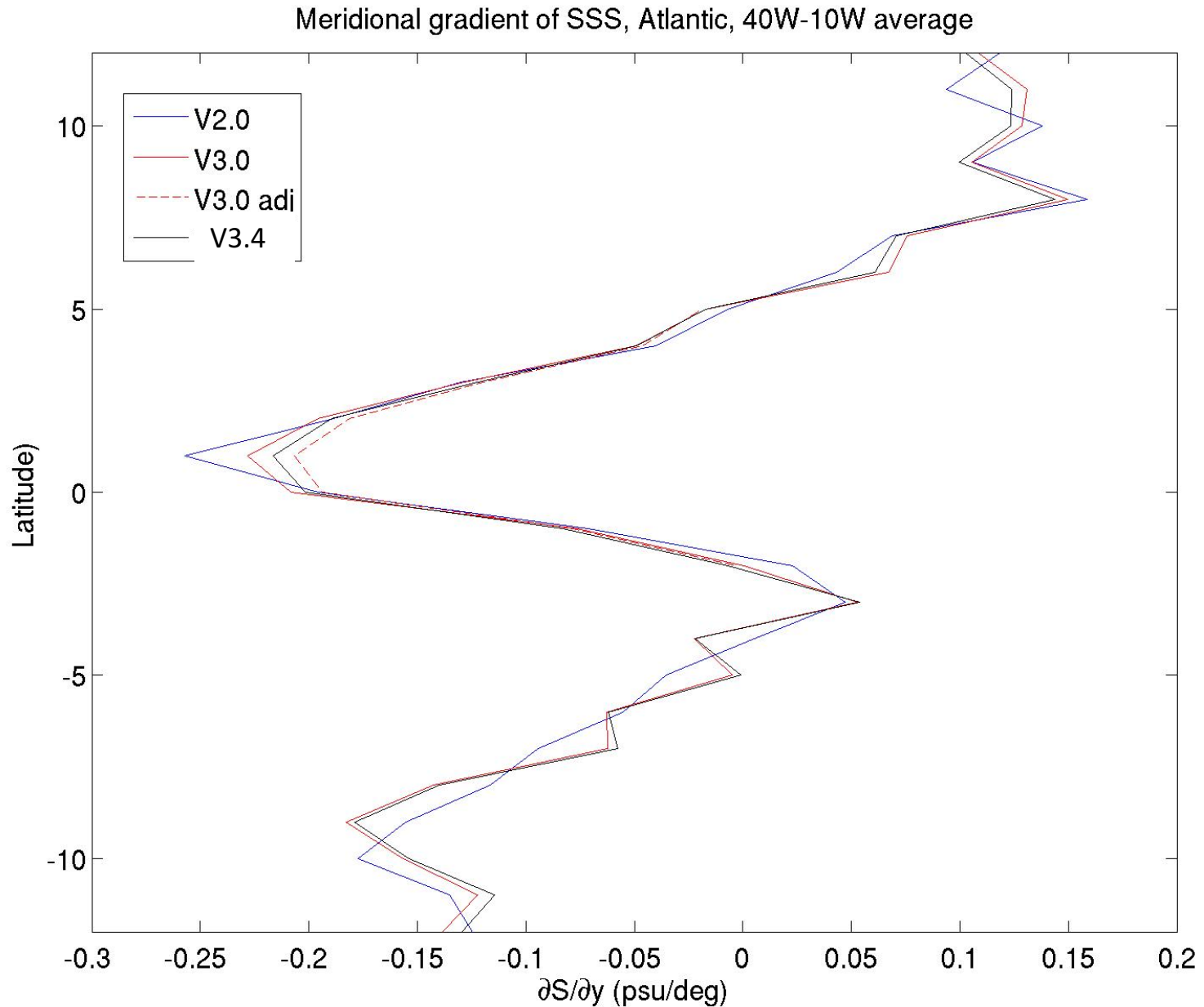
Summary

- Averaged magnitude of regional bias:
  V3.4 is similar to V2.0 and V3.0_adj, and significantly better than V3.0.

- Averaged standard deviation w.r.t. Argo (time-mean bias not considered):
  V3.4 is similar to V3.0 and V3.0_adj, but significantly better than V2.0.

- Averaged r.m.s. difference w.r.t. Argo (time-mean bias included):
  V3.4 is similar to V3.0_adj, and significantly better than V2.0 and V3.0.

- Time-mean N-S SSS gradients in the equatorial Pacific & Atlantic (1°N, TIW regions):
  V3.4 is between V3.0 and V3.0_adj, but weaker than V2.0.
  Expect TIW amplitude in V3.4 to be weaker than V2.0 & V3.0, but stronger than V3.0_adj.

- **V3.4 may meet L-1 accuracy requirement of SSS in triple co-location analysis (like V3.0_adj).**

	V2.0	V3.0	V3.0 adj	V3.4
Global mean bias	-0.052	-0.009	0.005	-0.026
Averaged regional absolute time-mean bias	0.14	0.19	0.13	0.13
Averaged std. dev.	0.24	0.18	0.17	0.17
Averaged r.m.s. diff.	0.29	0.27	0.23	0.23