

FC2410 – Florida Straits 27°N Section

October 01–02, 2024 (13.3 hour section occupation)

- **9 LADCP velocity profiles** – dual WH300 LADCP
processed with GEOMAR v10.20 at 10m vertical resolution...
- **137 SADCP velocity profiles** – OS75 SADCP narrowband
processed with CODAS3 at 16m (OS75) vertical resolution...
- **1000m by 10m grid resolution** – cross-track velocity field
profiles interpolated onto grid using either MATLAB *griddata* or MATLAB *gridfit*...

Grid Interpolation and Boundary Extrapolation:

- total cross-sectional area = 43.00 km² (percent total area = 100%)
- cross-sectional area of gridded velocity field = 41.15 km² (95.69%)
- cross-sectional area of boundary (to be extrapolated) = 1.86 km² (4.31%)

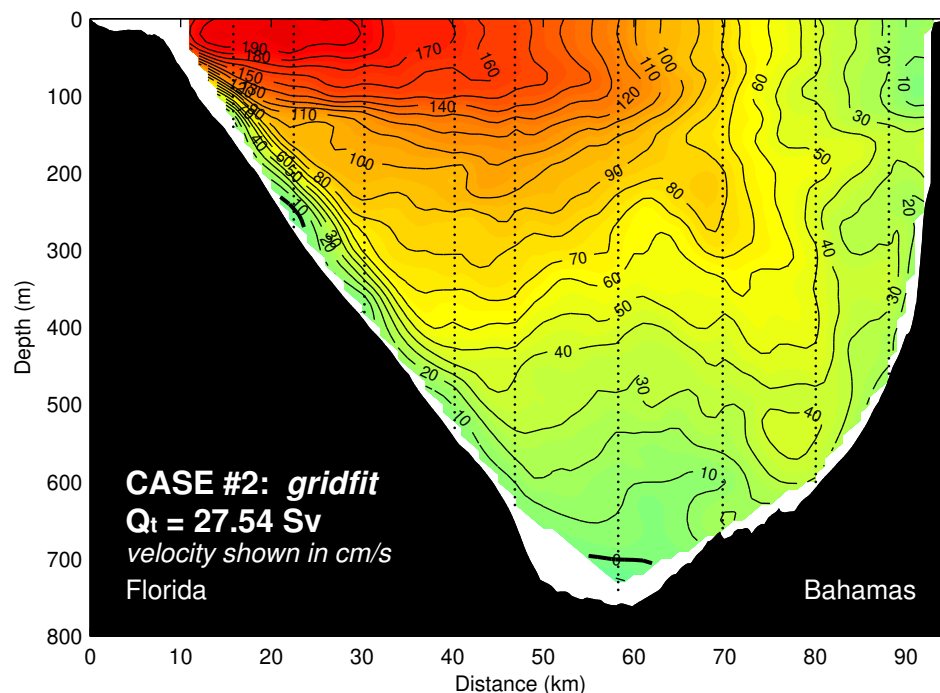
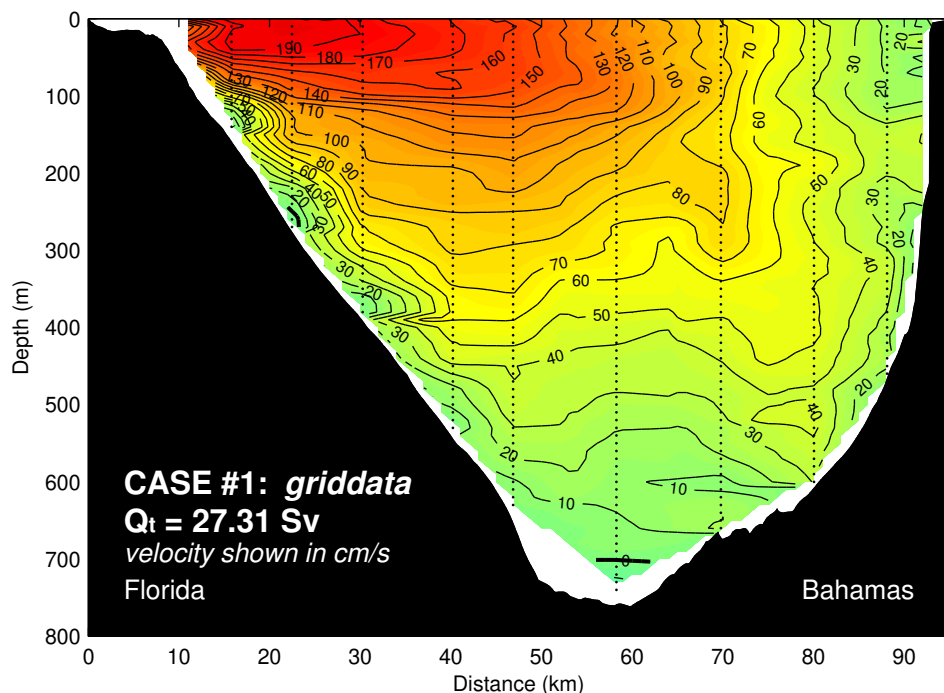
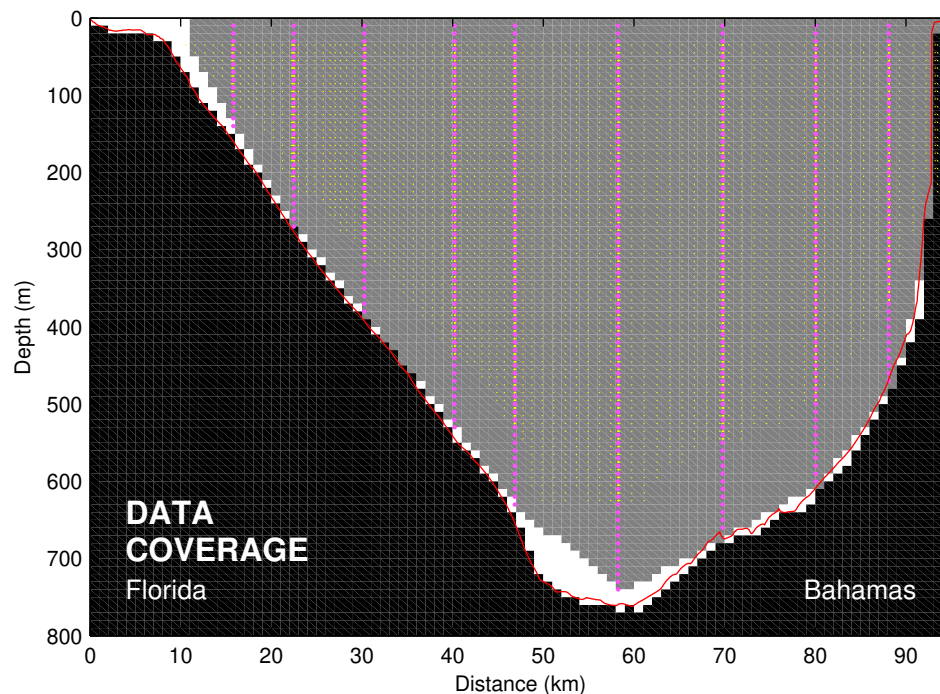
CASE #1: interp. = *griddata* (linear), extrap. = *none*

- total detided transport (Q_t) = 27.31 Sv (1 Sv = 10⁶m³s⁻¹)
- *griddata* is a true interpolant (exactly predicts all supplied data)*

CASE #2: interp. = *gridfit* (linear/triangles, smoothing = 0.4), extrap. = *none*

- total detided transport (Q_t) = 27.54 Sv
- *gridfit* is NOT a true interpolant (simulates behavior of supplied data)

CASE #1 Q_t – CASE #2 Q_t = -0.23 Sv (transport difference)



FC2410 – Florida Straits 27°N Section

October 01–02, 2024 (13.3 hour section occupation)

- **9 LADCP velocity profiles** – dual WH300 LADCP
processed with GEOMAR v10.20 at 10m vertical resolution...
- **137 SADCP velocity profiles** – OS75 SADCP narrowband
processed with CODAS3 at 16m (OS75) vertical resolution...
- **1000m by 10m grid resolution** – cross-track velocity field
profiles interpolated onto grid using either MATLAB *griddata* or MATLAB *gridfit*...

Grid Interpolation and Boundary Extrapolation:

- total cross-sectional area = 43.00 km² (percent total area = 100%)
- cross-sectional area of gridded velocity field = 41.15 km² (95.69%)
- cross-sectional area of boundary (to be extrapolated) = 1.86 km² (4.31%)

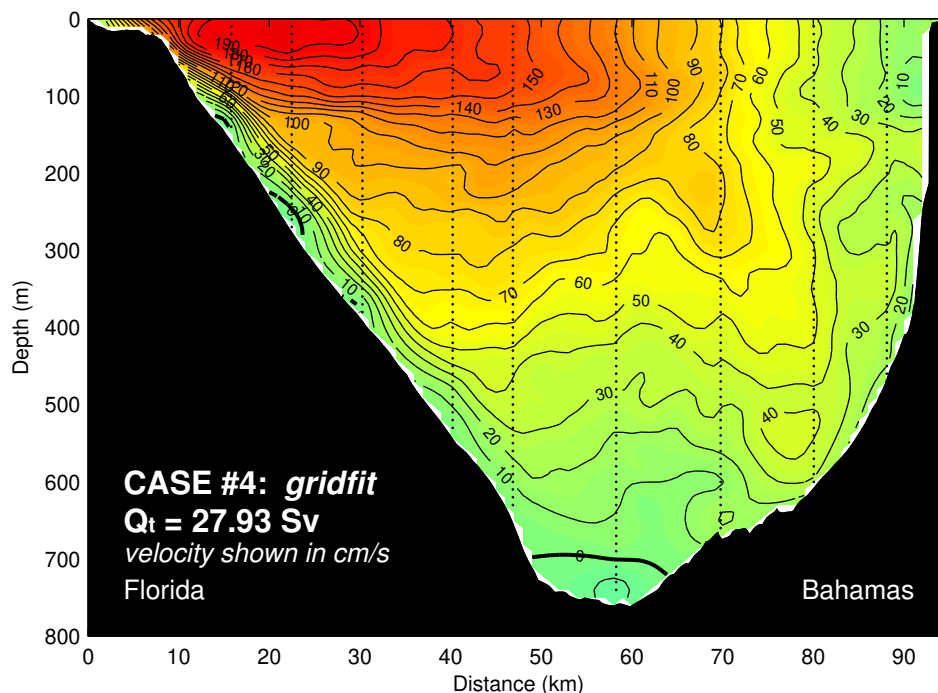
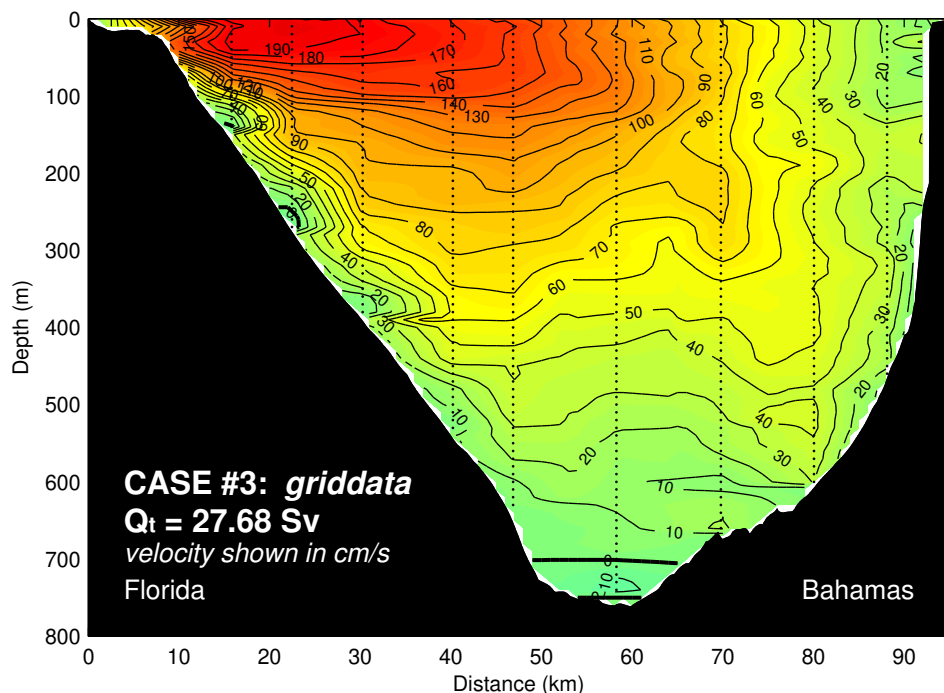
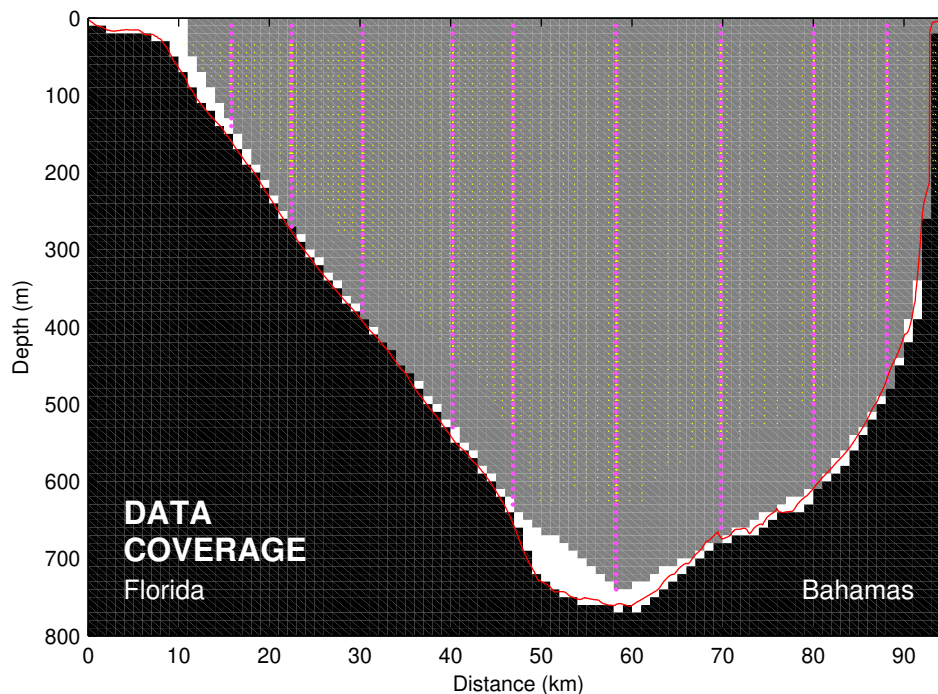
CASE #3: interp. and extrap. = *griddata* (linear)

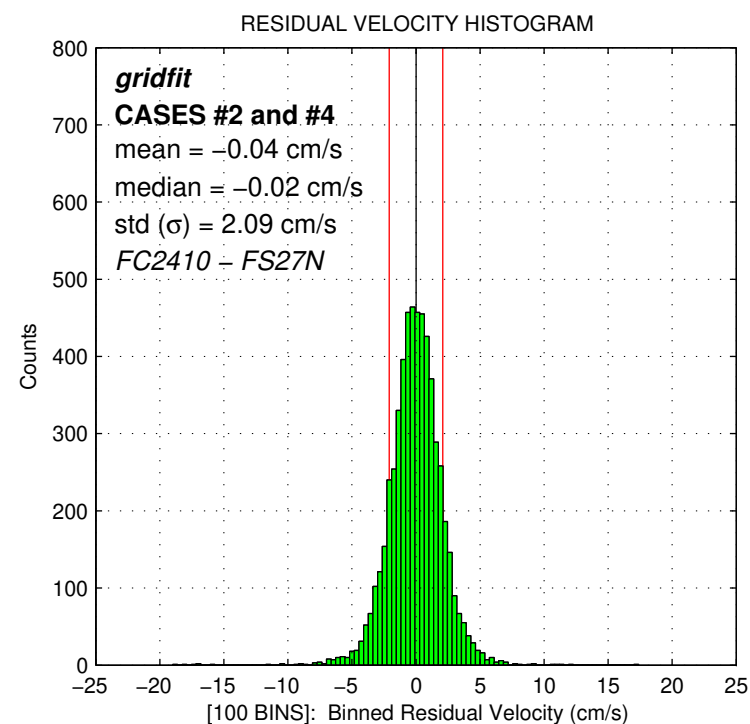
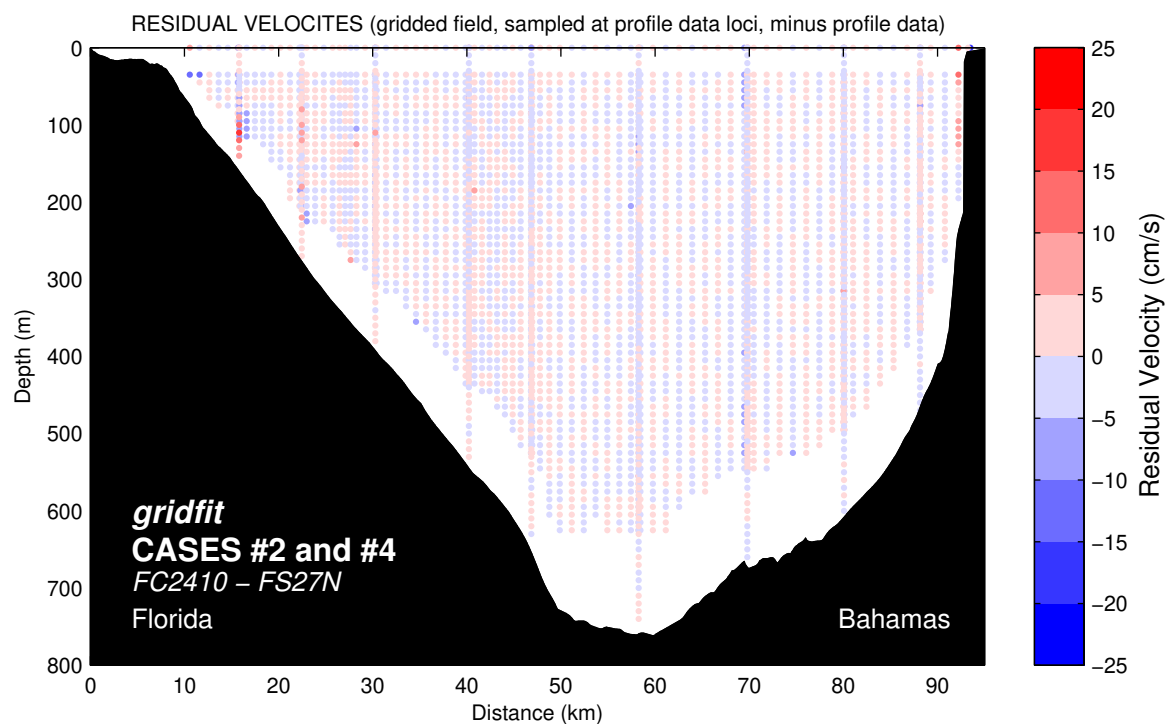
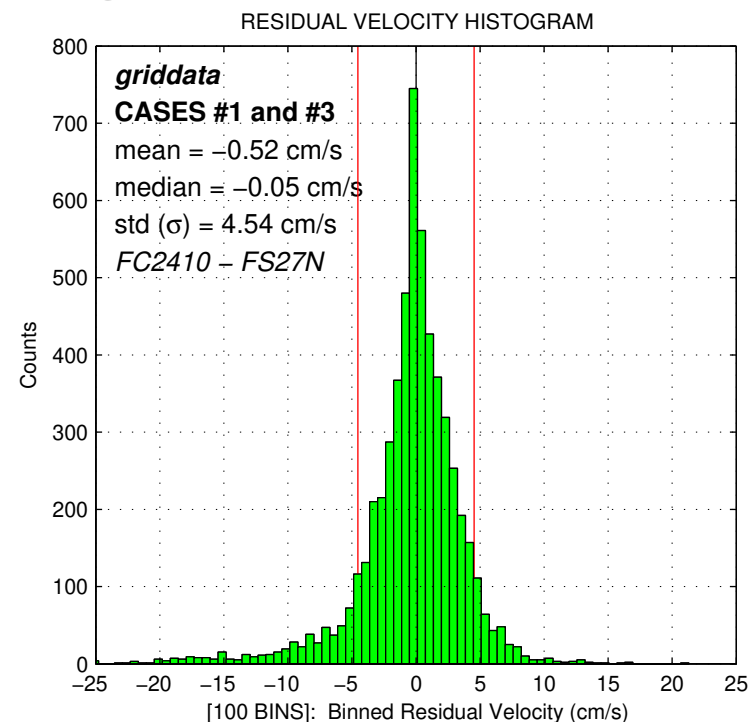
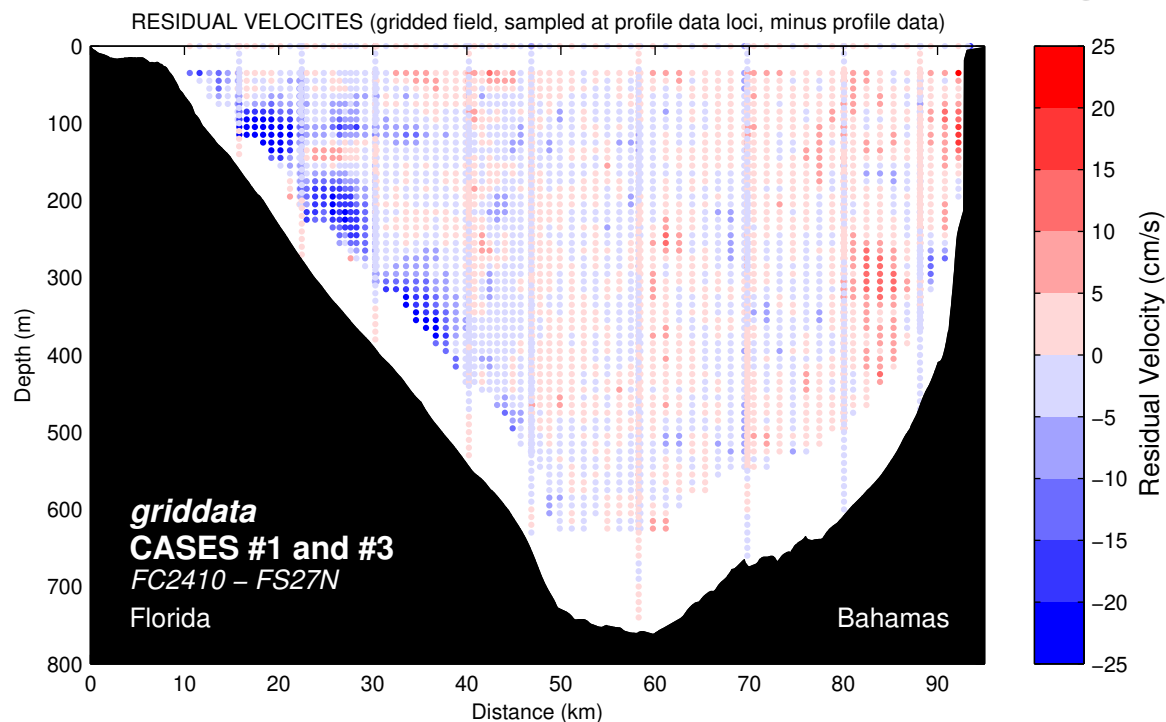
- total detided transport (Q_t) = 27.68 Sv (1 Sv = 10⁶m³s⁻¹)
- extrapolated boundary transport contribution = 0.37 Sv

CASE #4: interp. and extrap. = *gridfit* (linear/triangles, smoothing = 0.4)

- total detided transport (Q_t) = 27.93 Sv
- extrapolated boundary transport contribution = 0.38 Sv

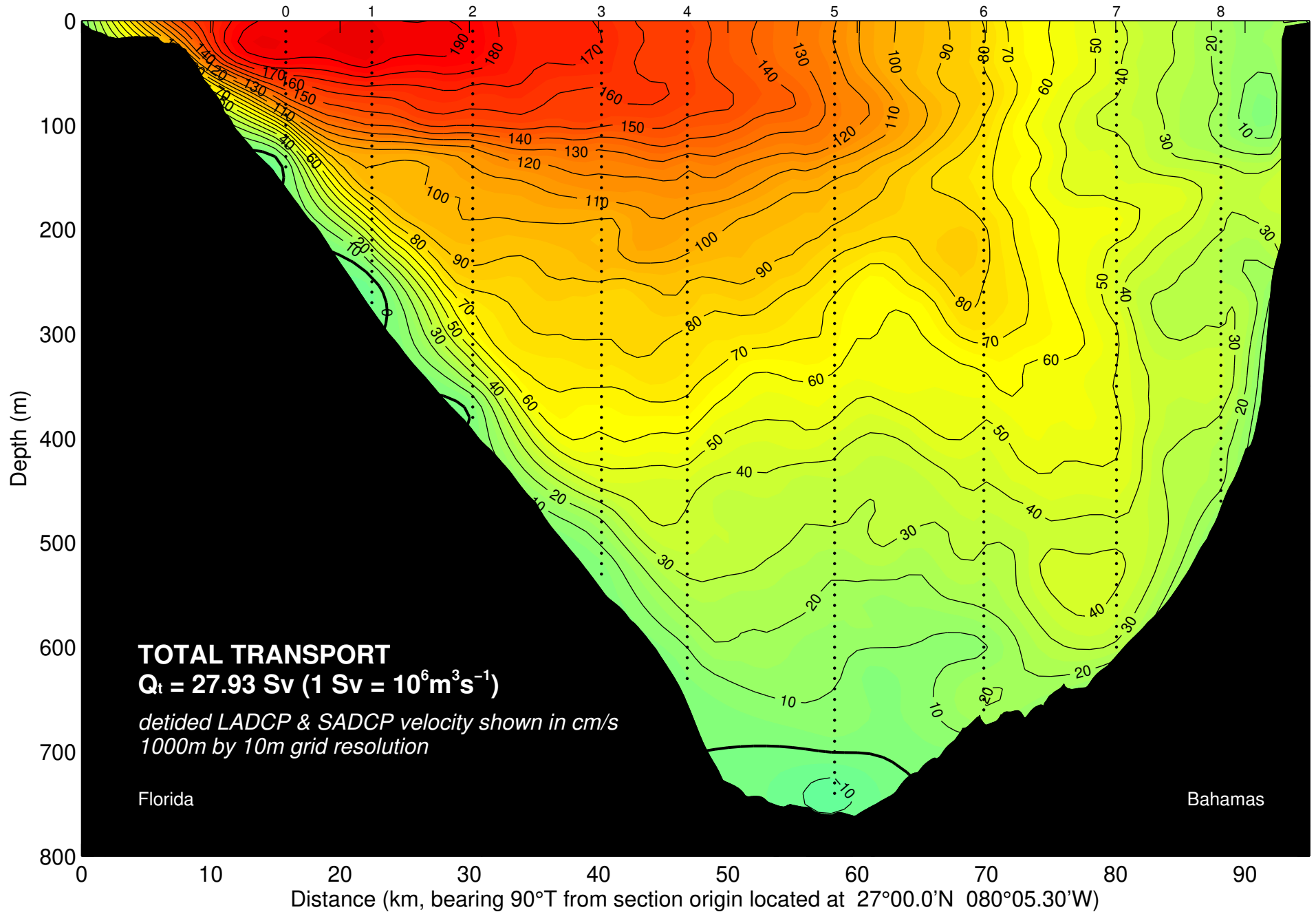
CASE #3 Q_t – CASE #4 Q_t = -0.24 Sv (transport difference)





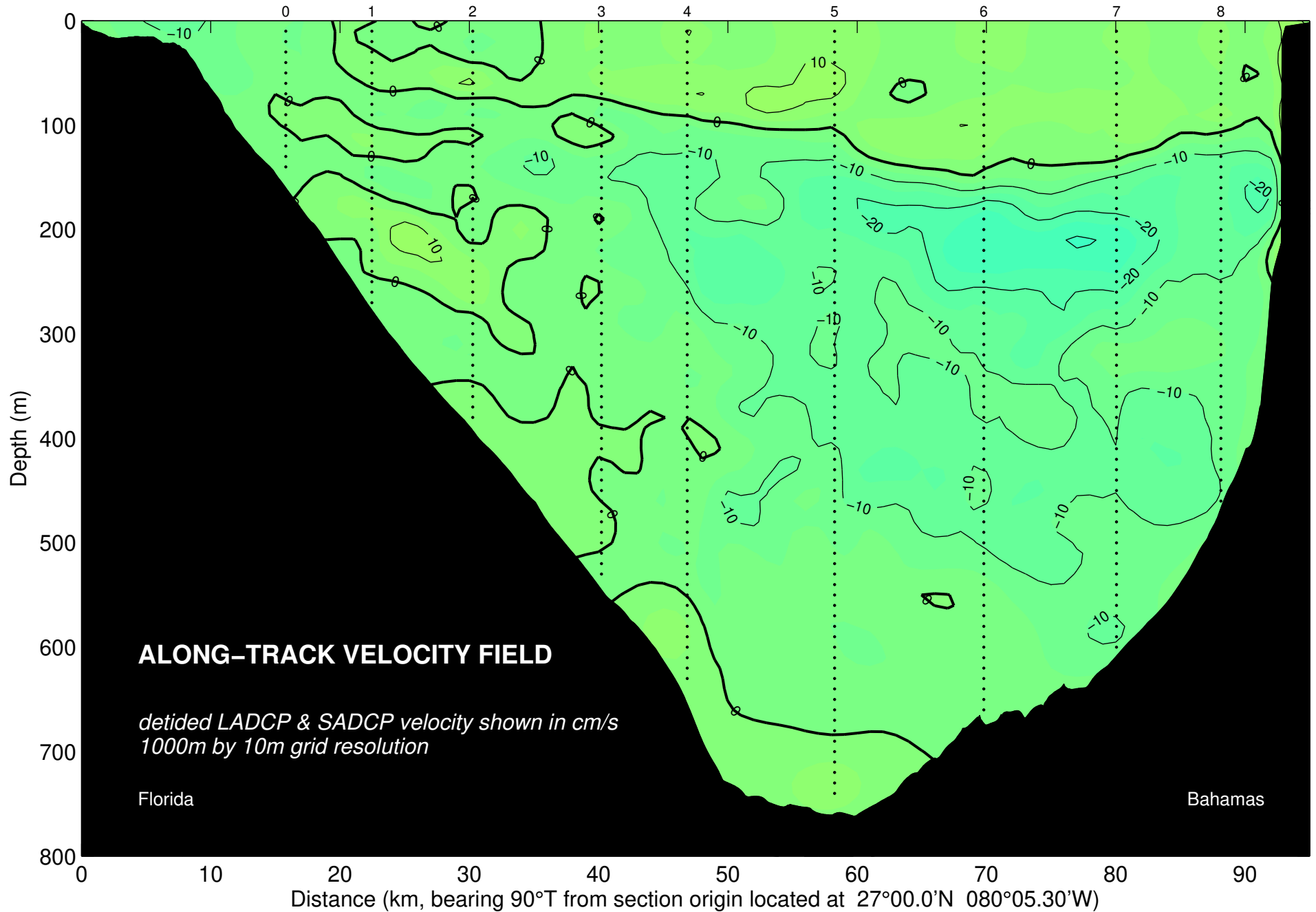
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



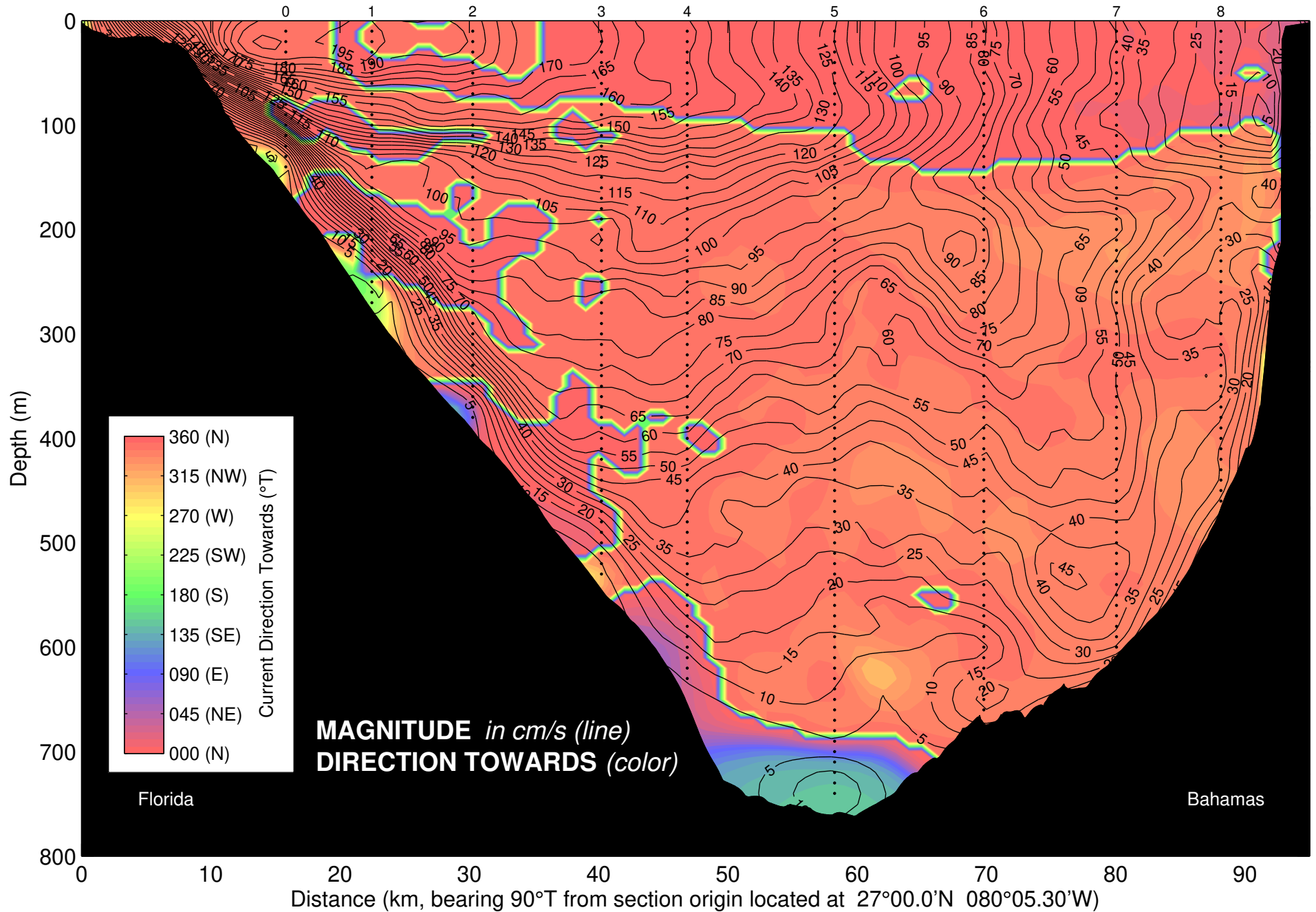
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



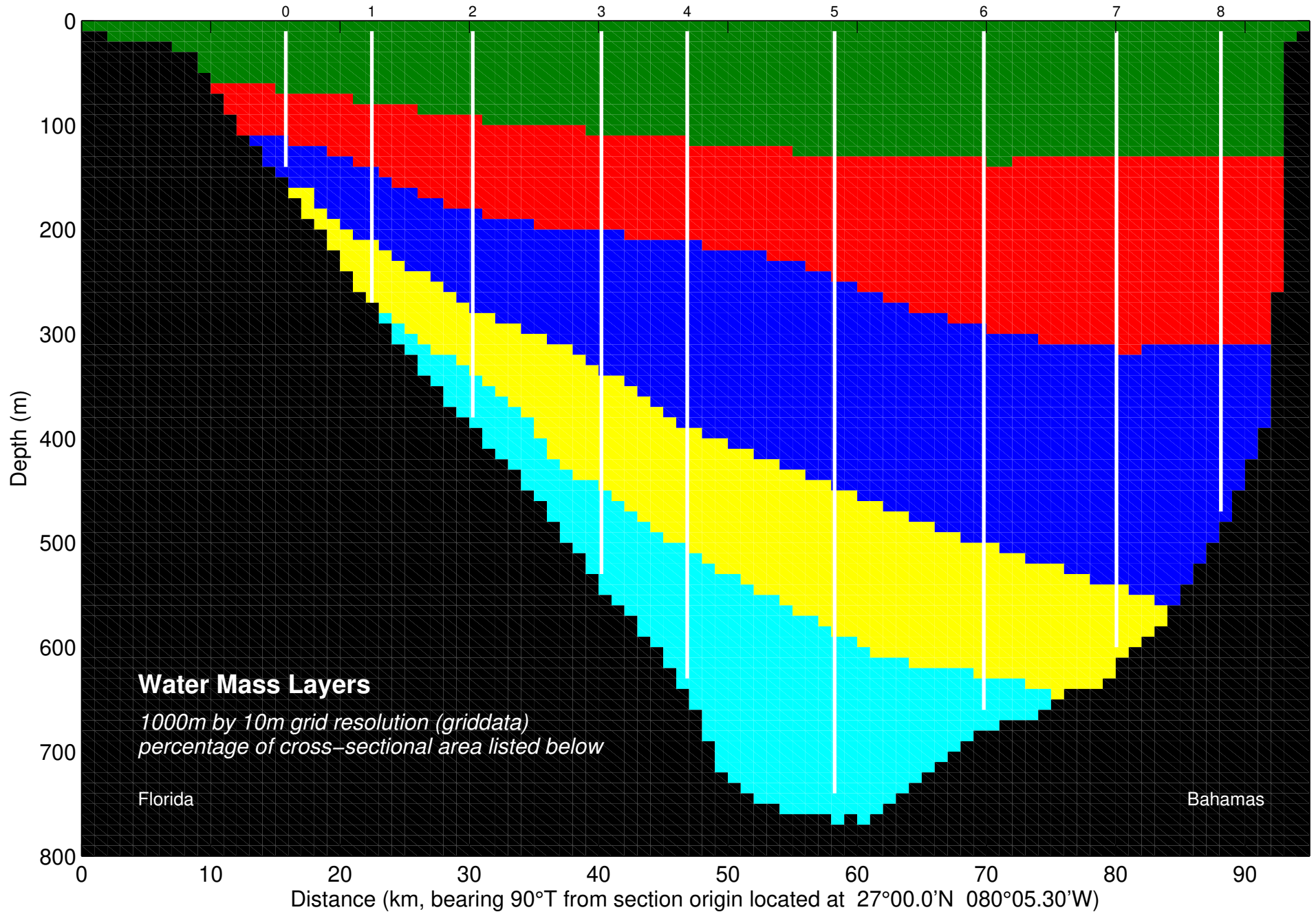
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



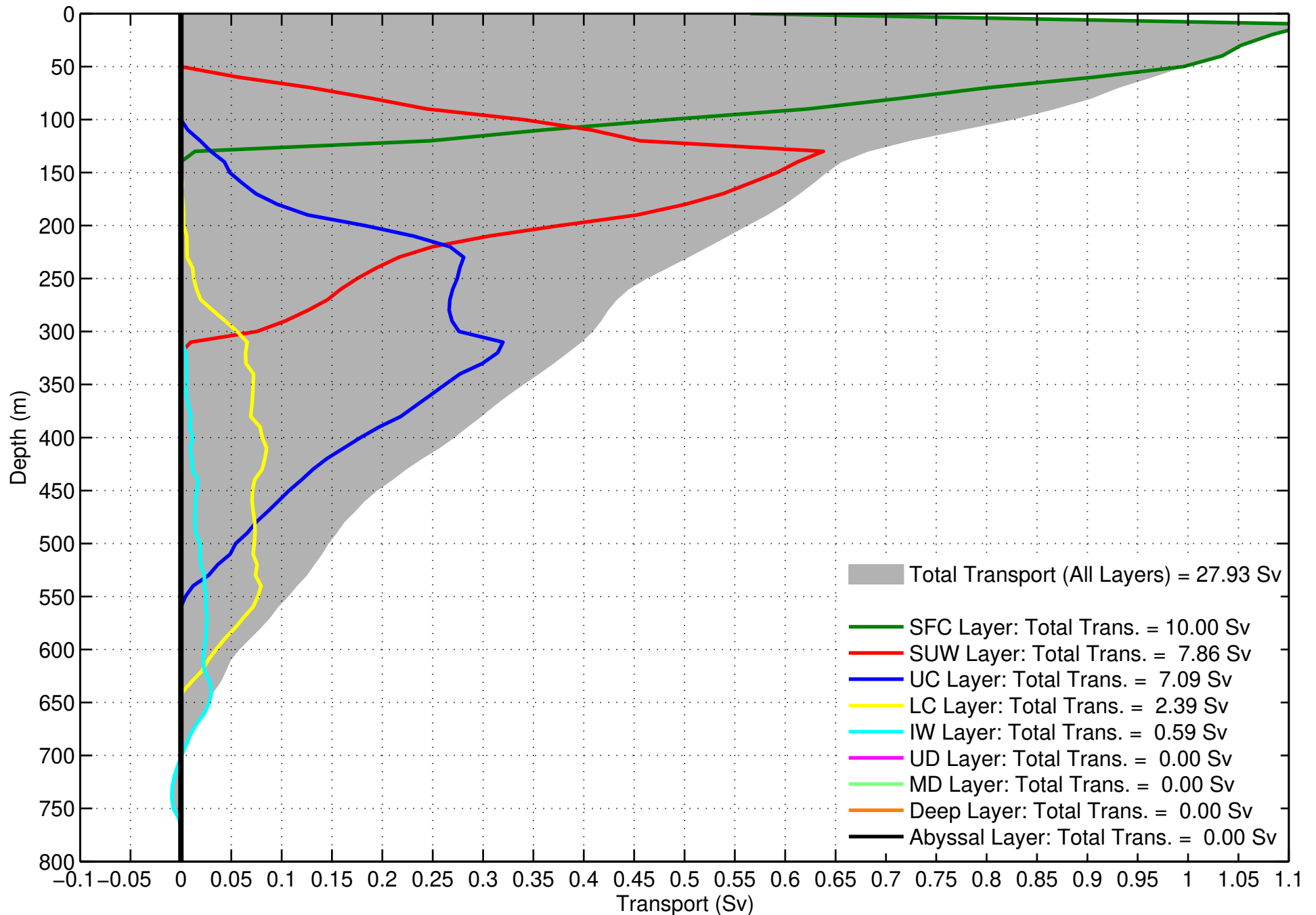
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



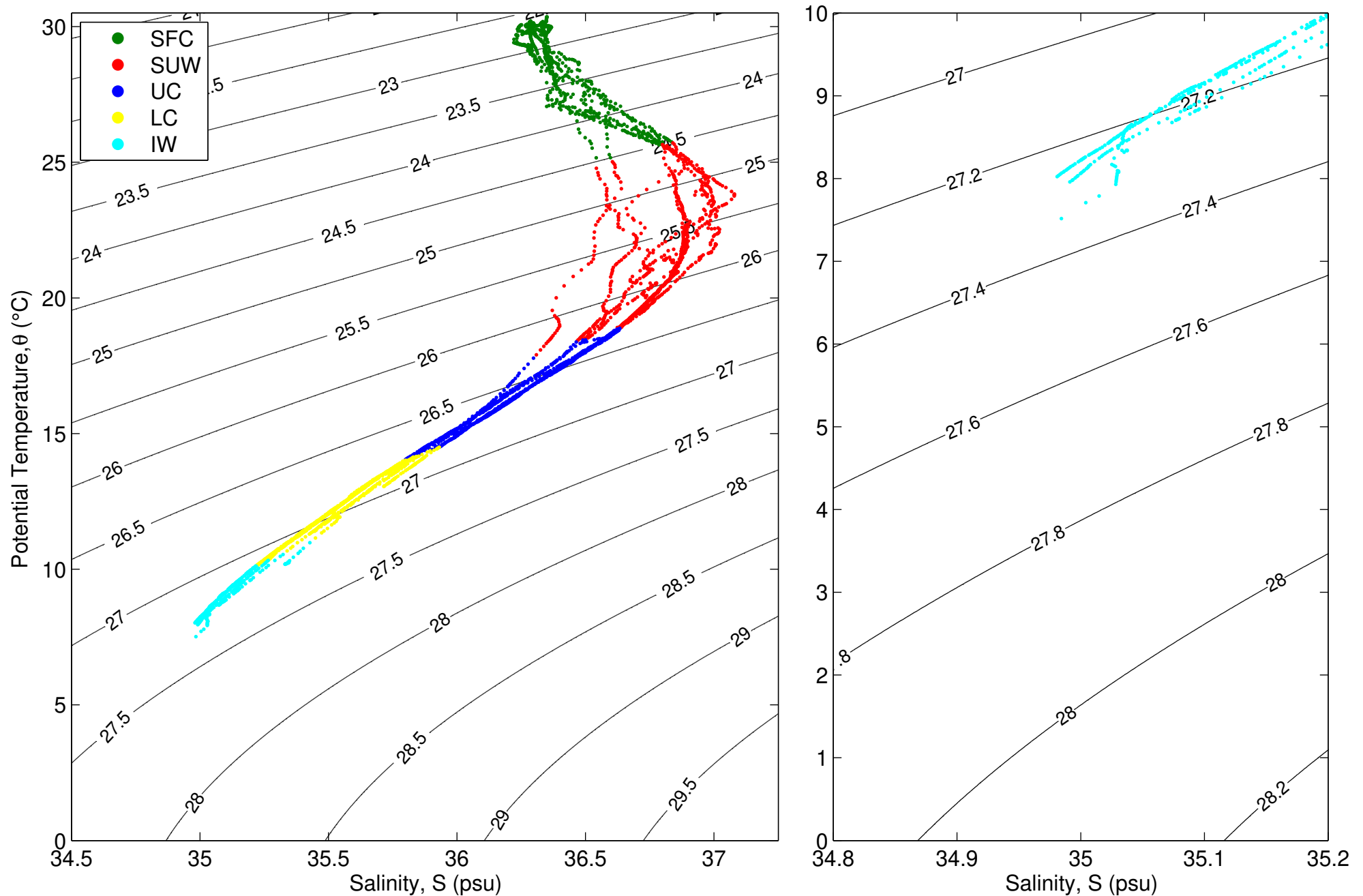
Florida Straits 27°N Section – Water Mass Transport Contributions

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



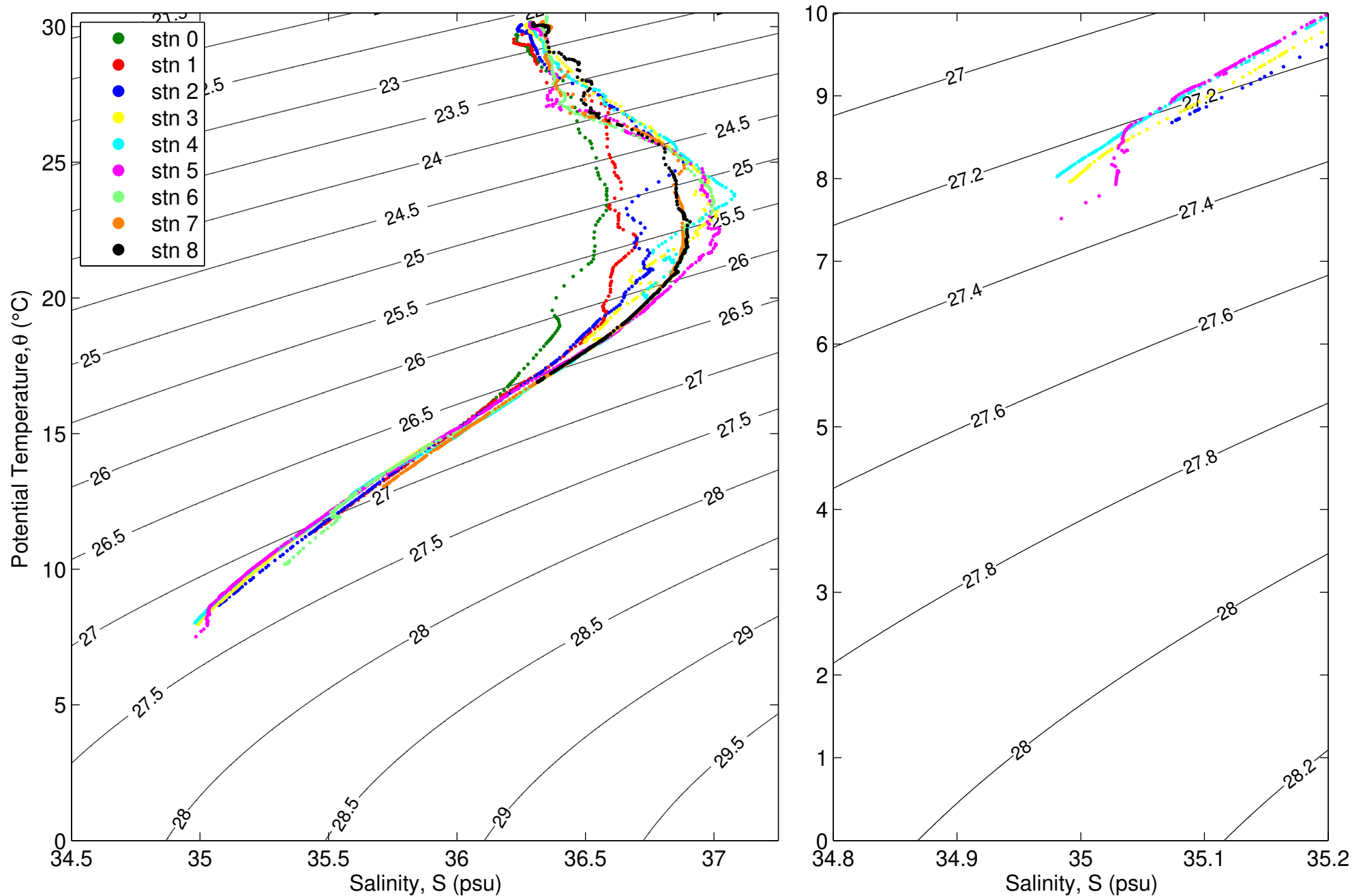
Florida Straits 27°N Section θ -S Diagram

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



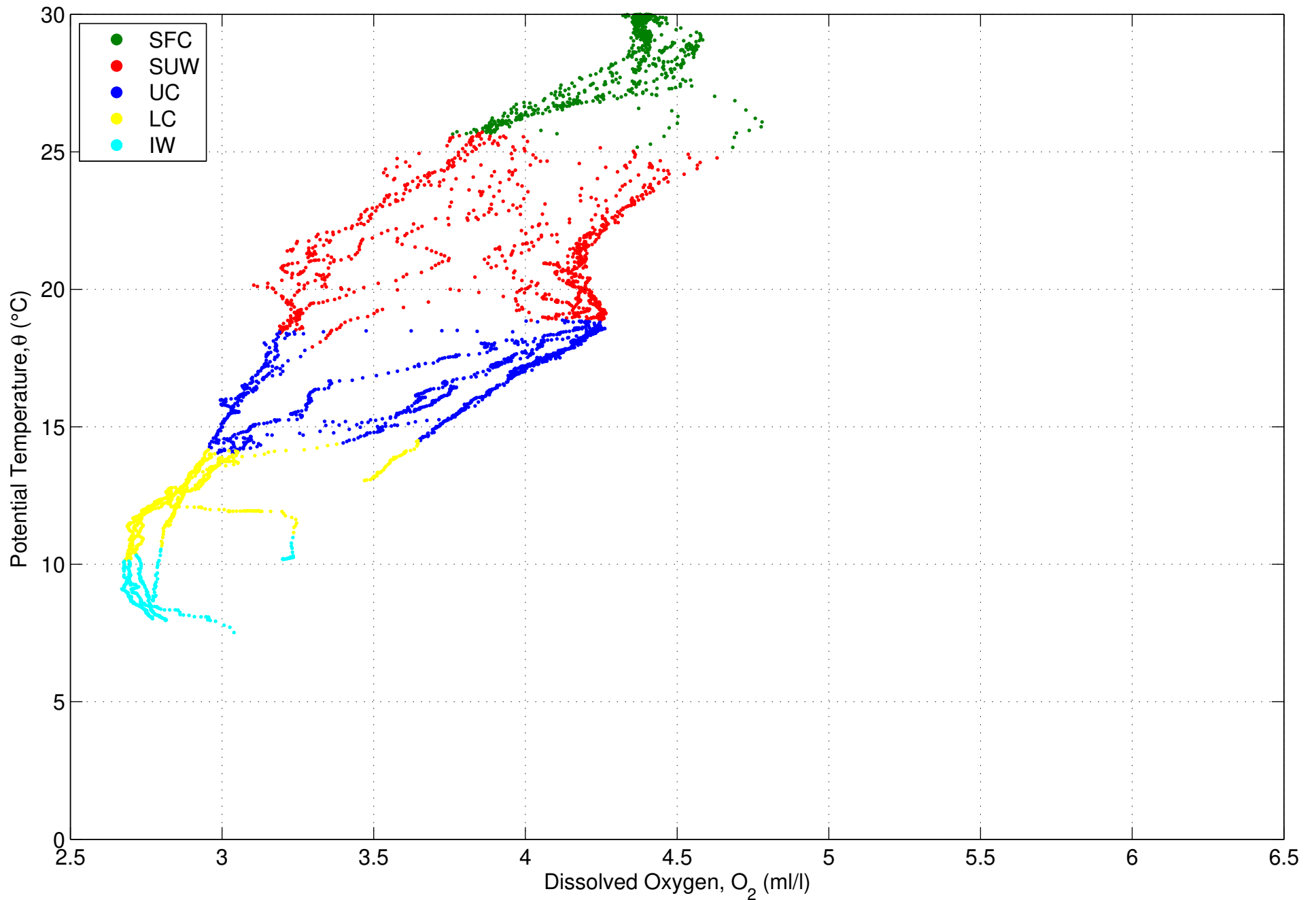
Florida Straits 27°N Section θ -S Diagram

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



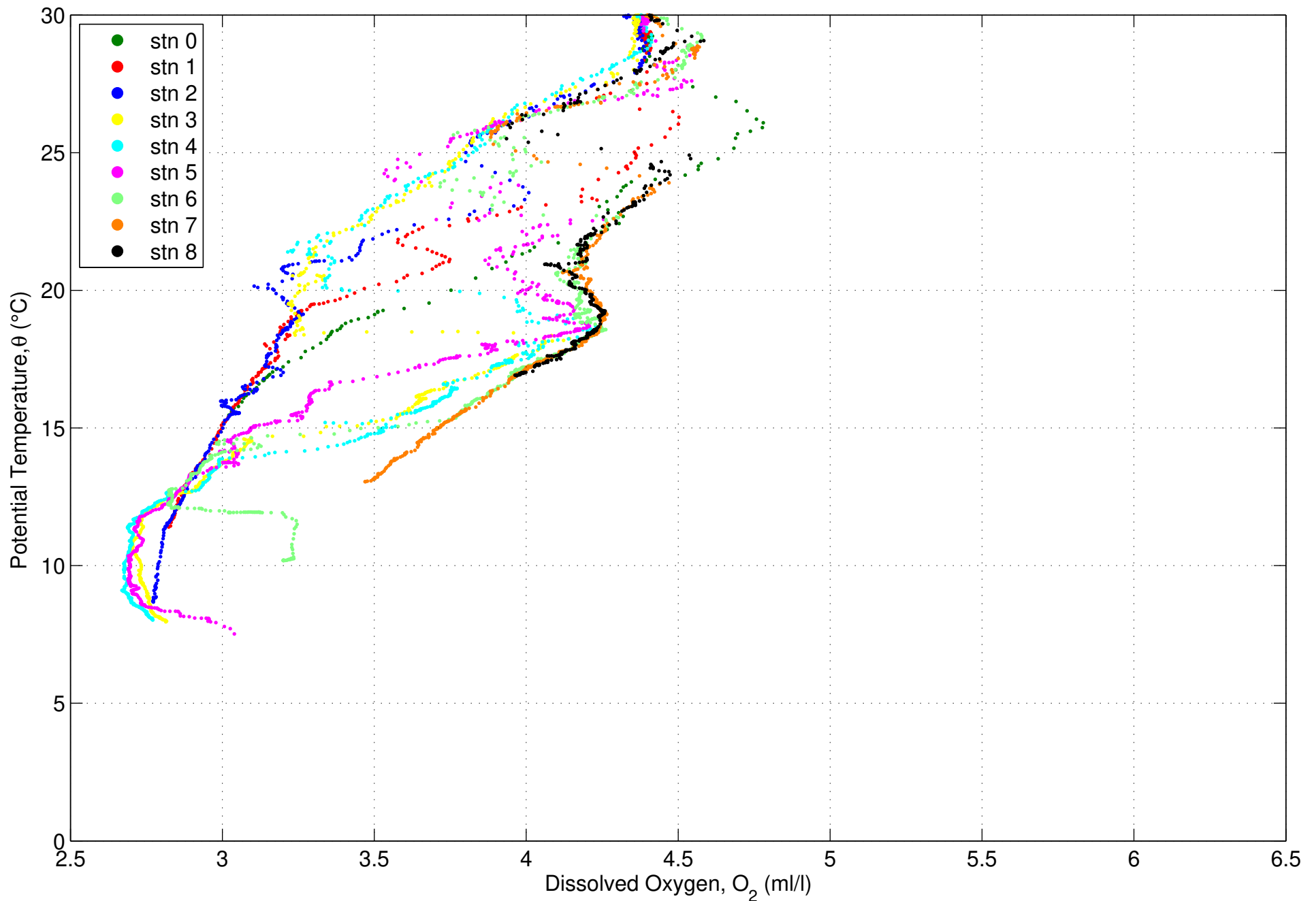
Florida Straits 27°N Section θ -O₂ Diagram

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



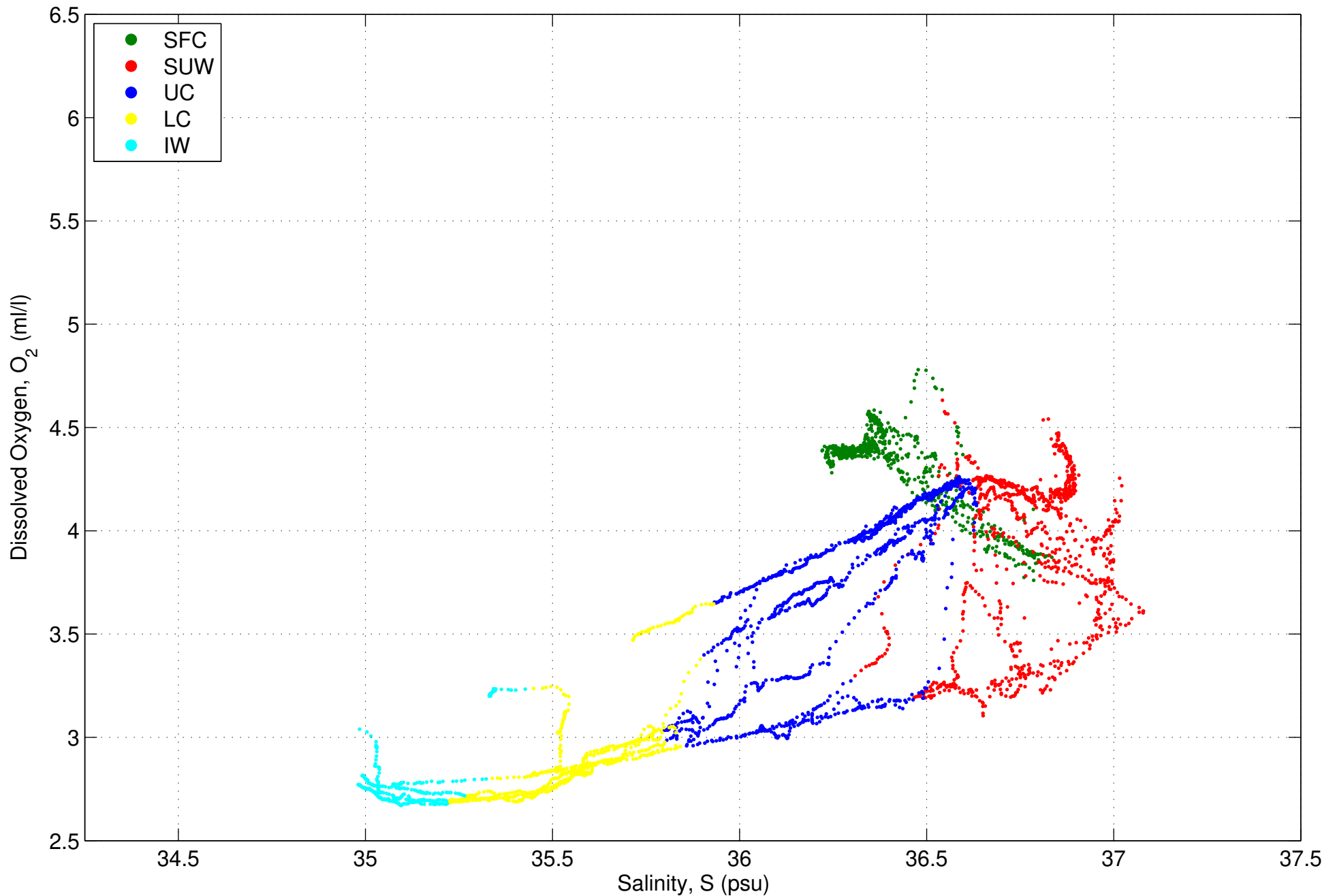
Florida Straits 27°N Section θ - O_2 Diagram

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



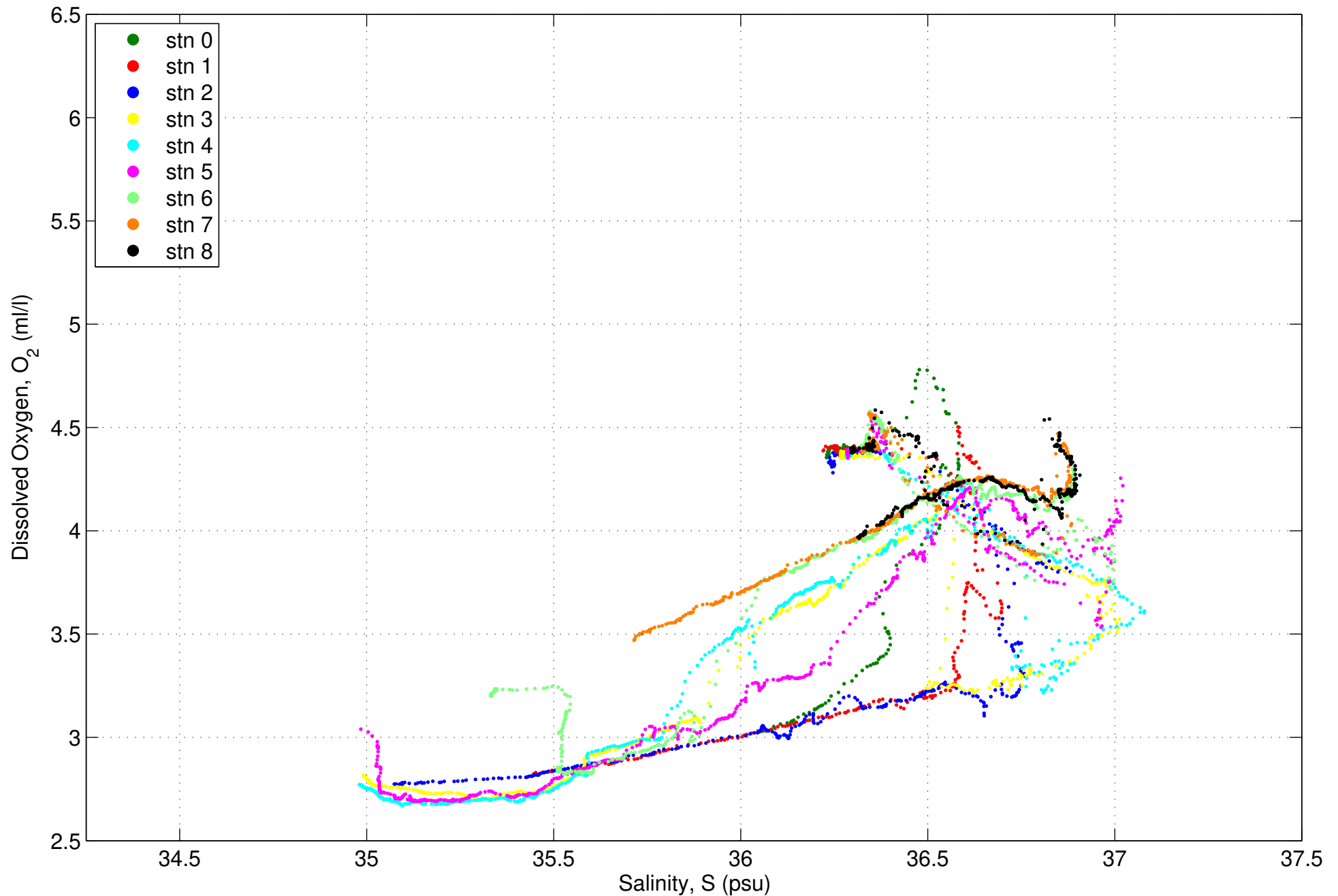
Florida Straits 27°N Section S-O₂ Diagram

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



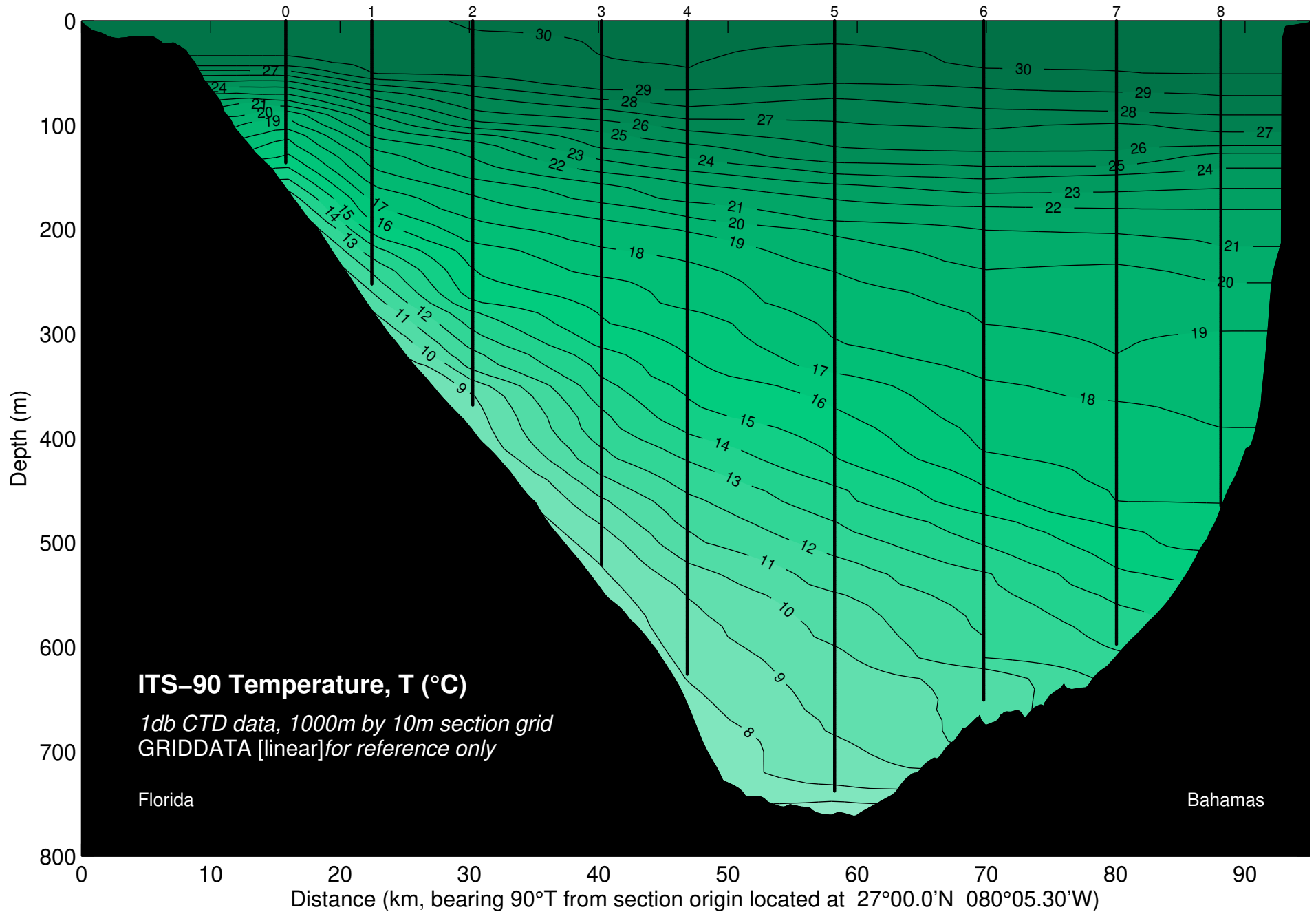
Florida Straits 27°N Section S-O₂ Diagram

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



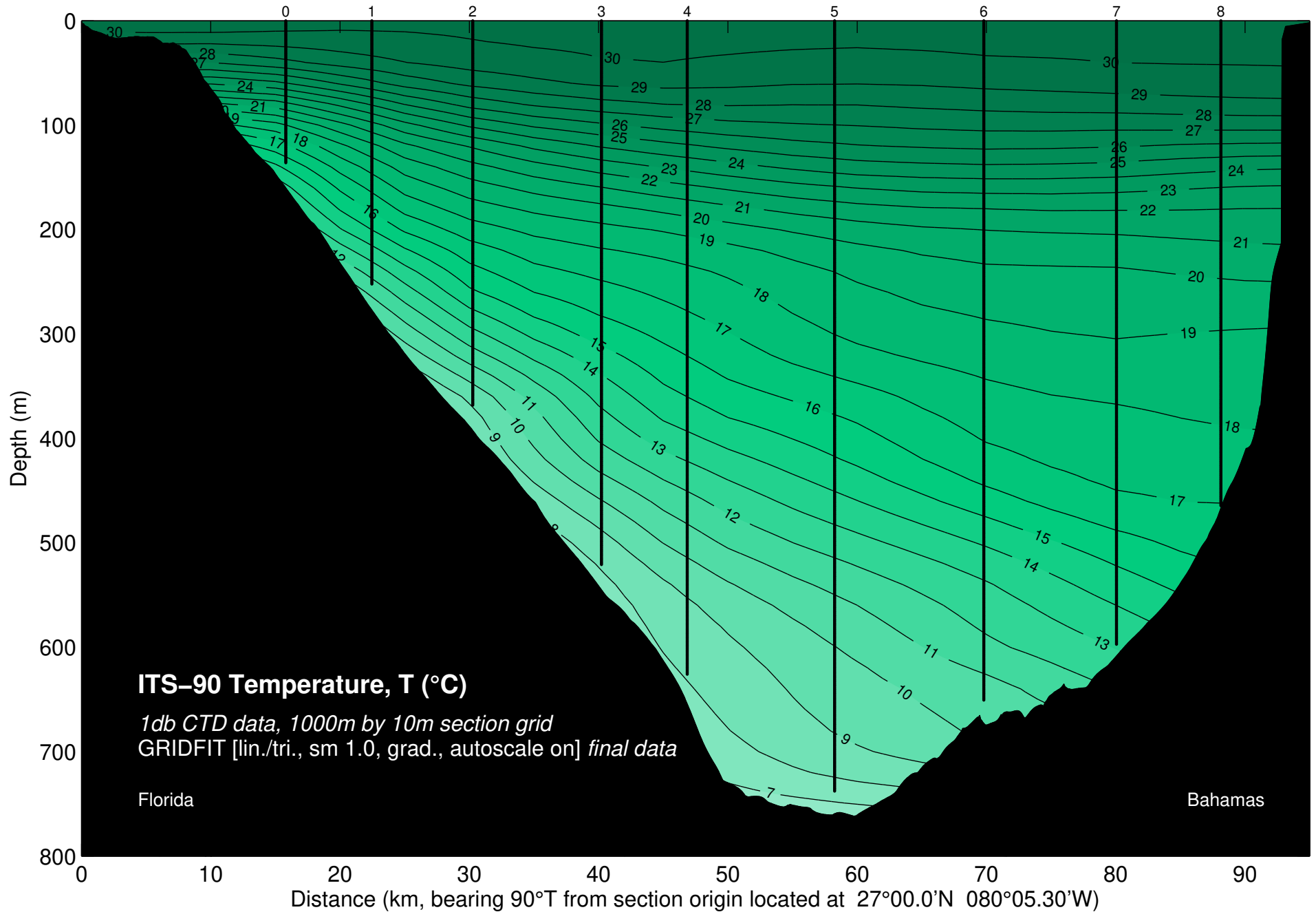
Florida Straits 27°N Section

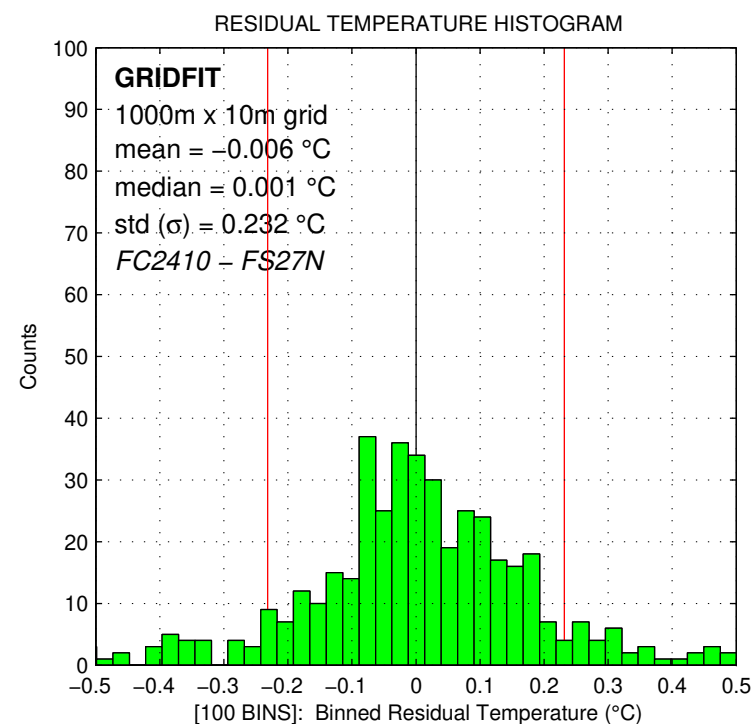
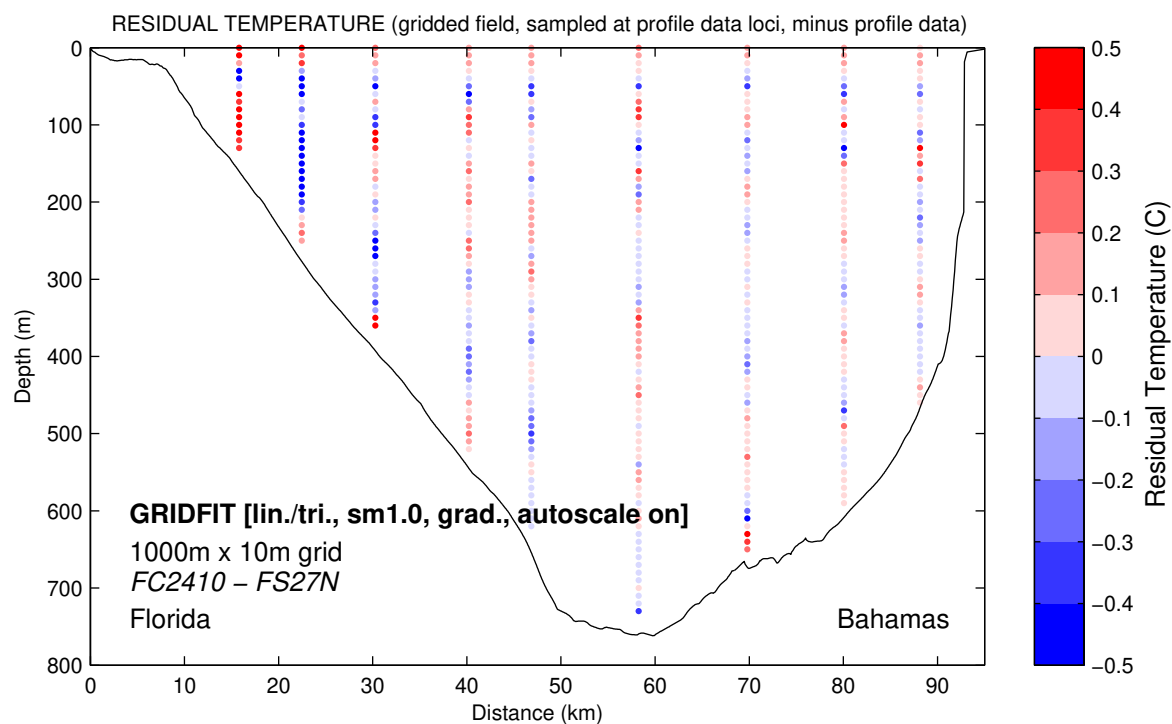
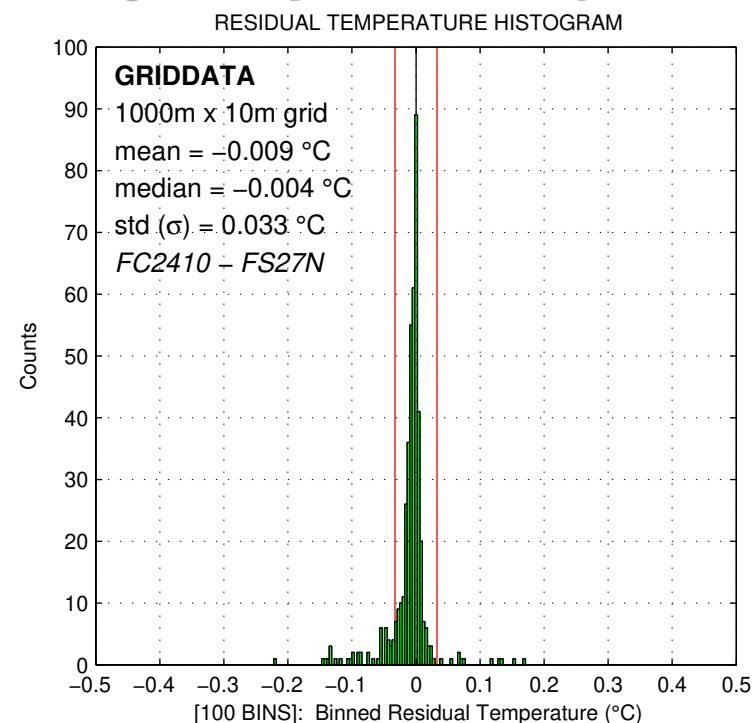
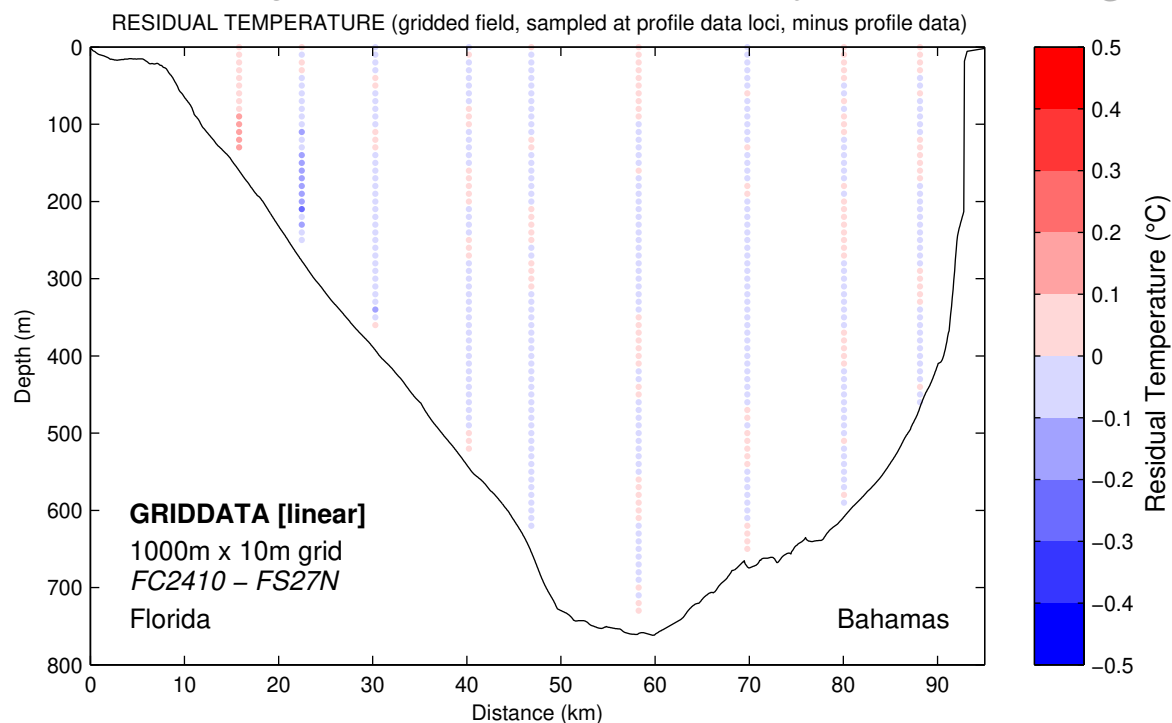
FC2410 – October 01–02, 2024 (13.3 hour section occupation)



Florida Straits 27°N Section

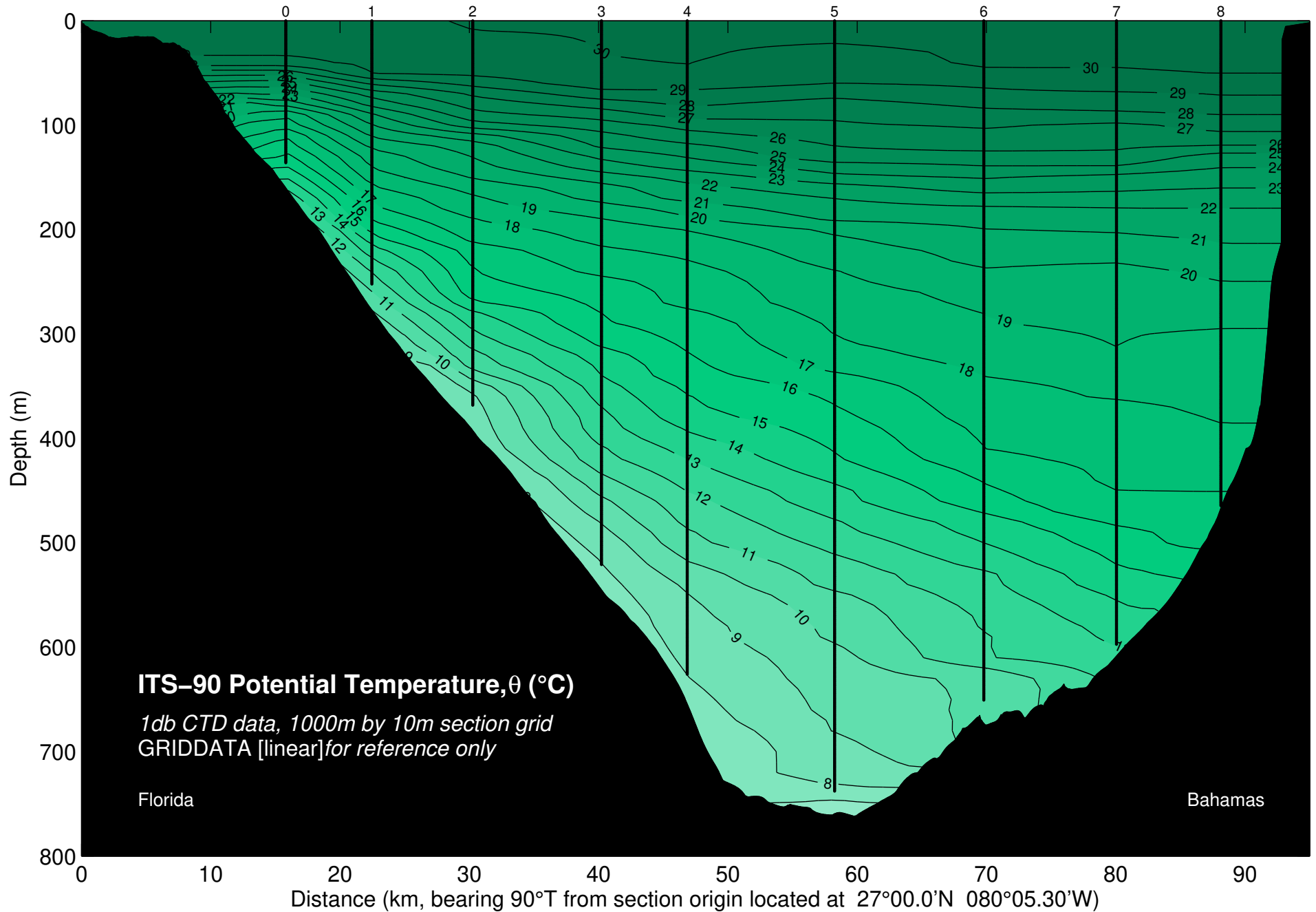
FC2410 – October 01–02, 2024 (13.3 hour section occupation)





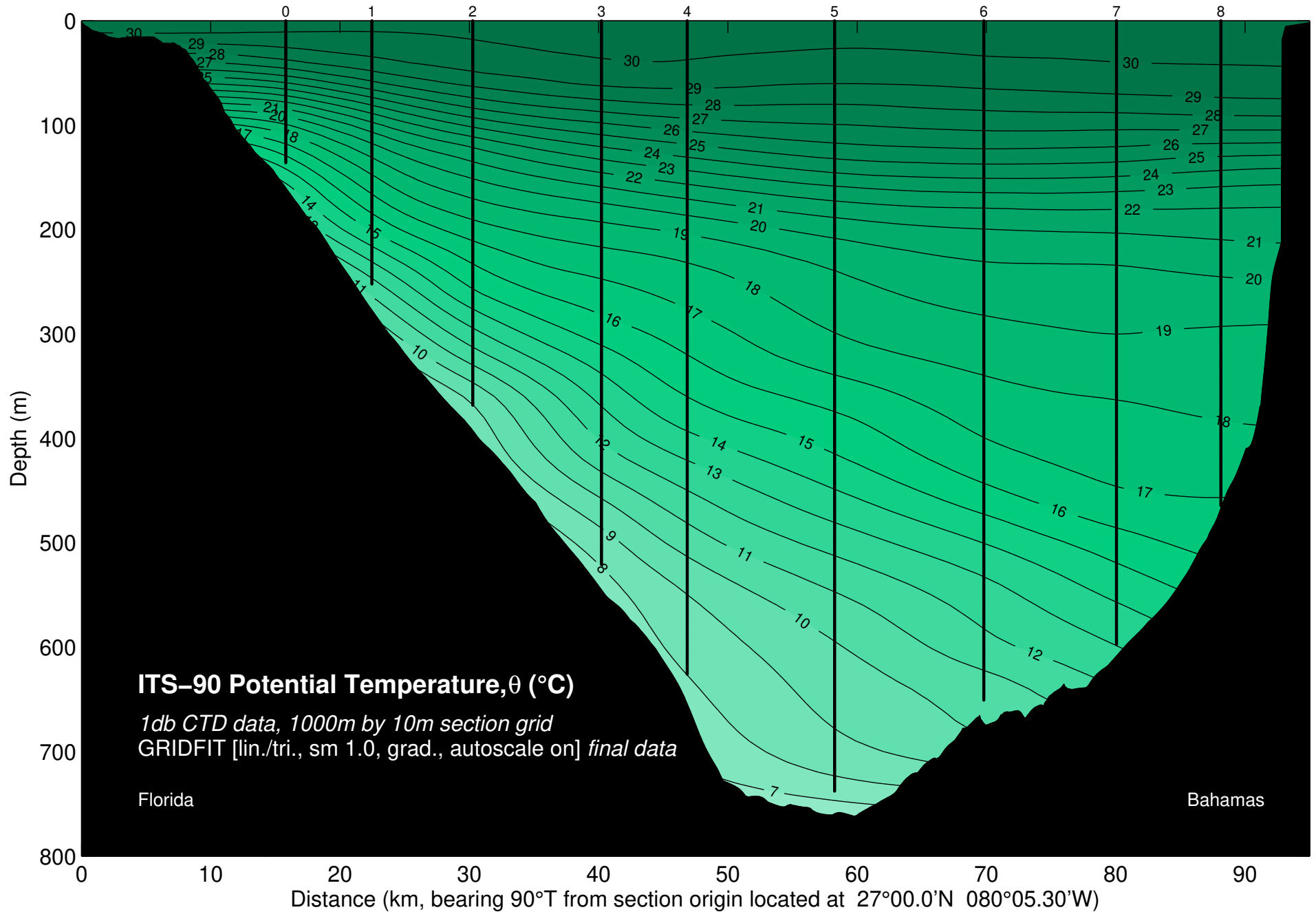
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

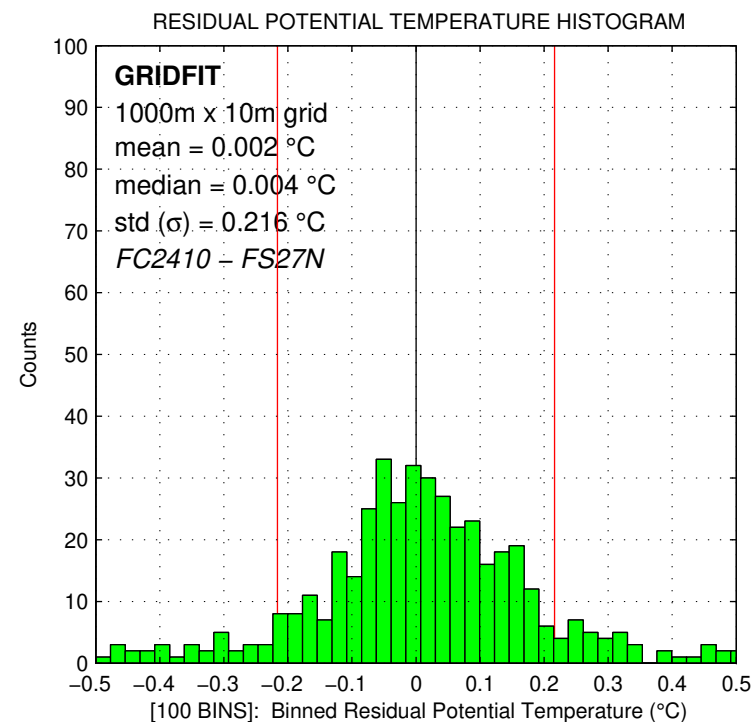
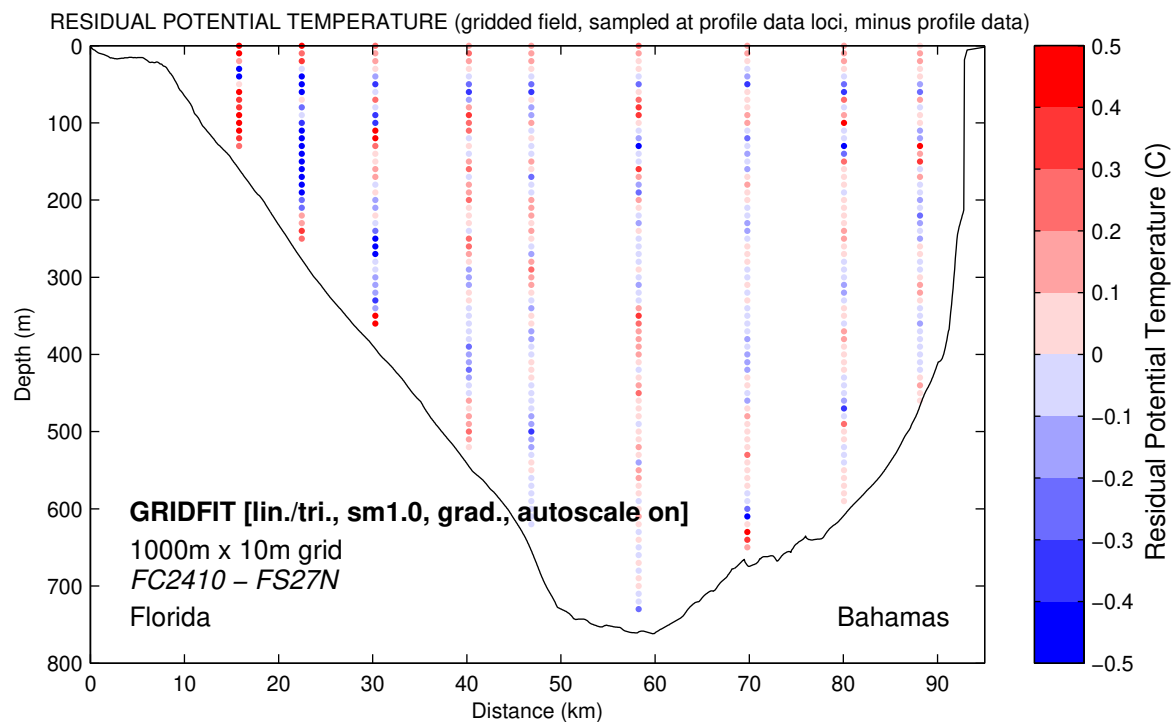
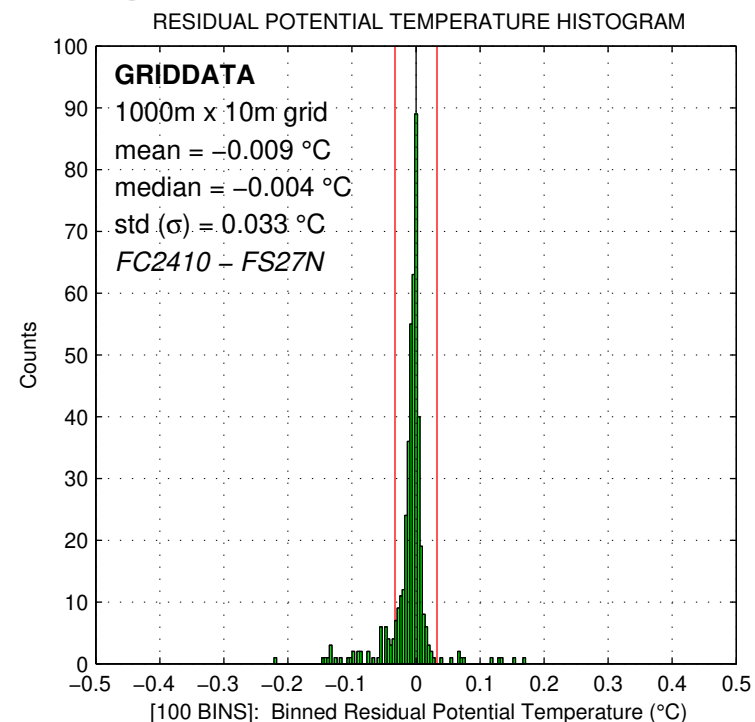
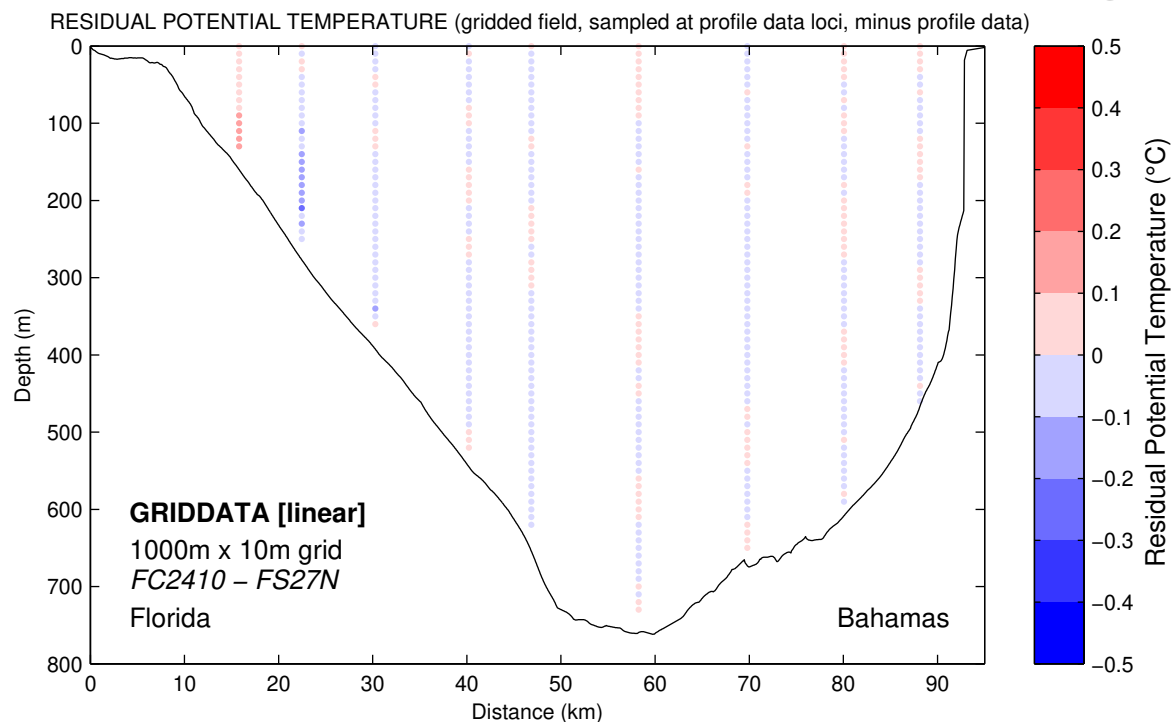


Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

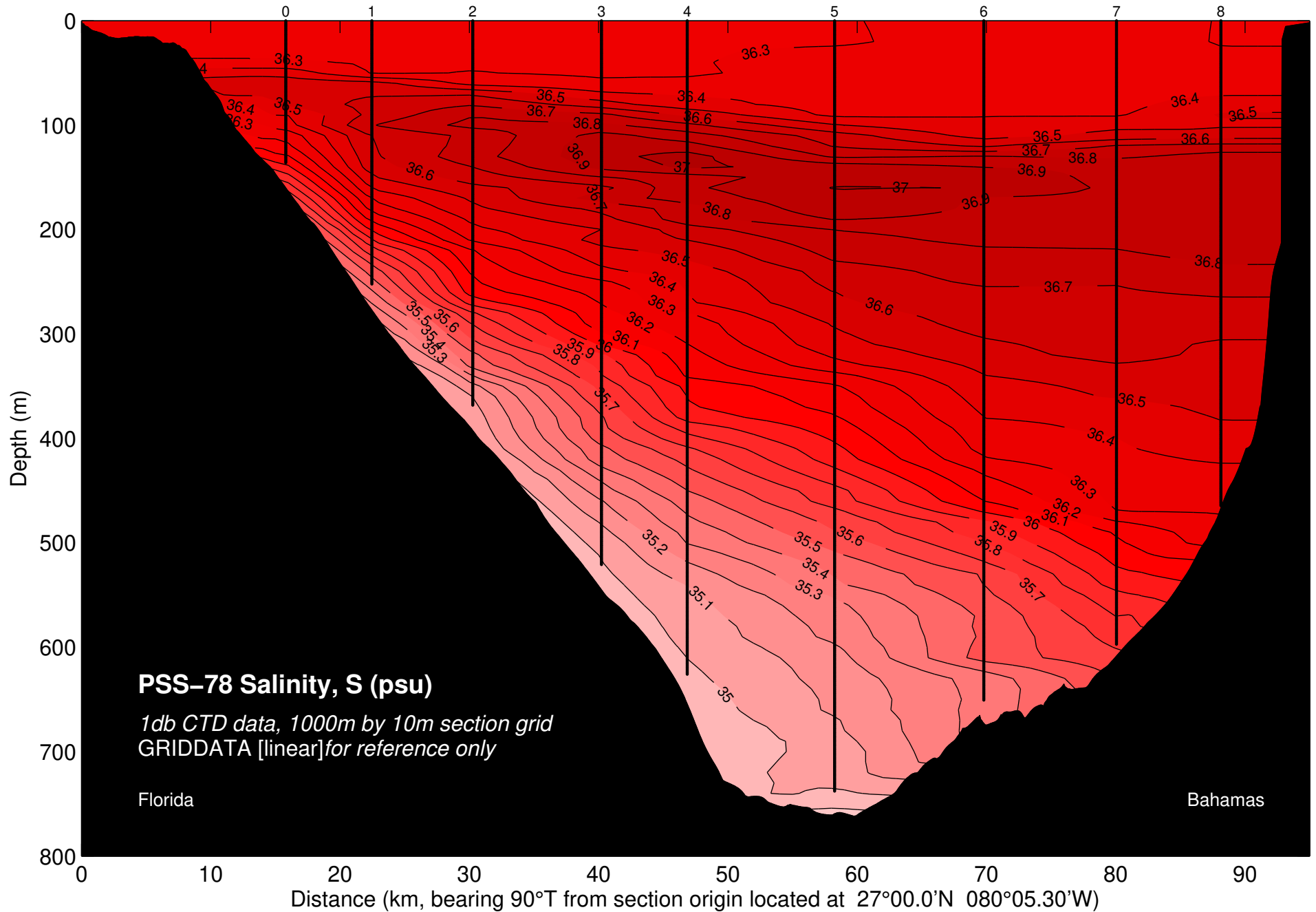


[PAGE 20 of 35] Section Tool Quality: How well do griddata and gridfit represent the original data?



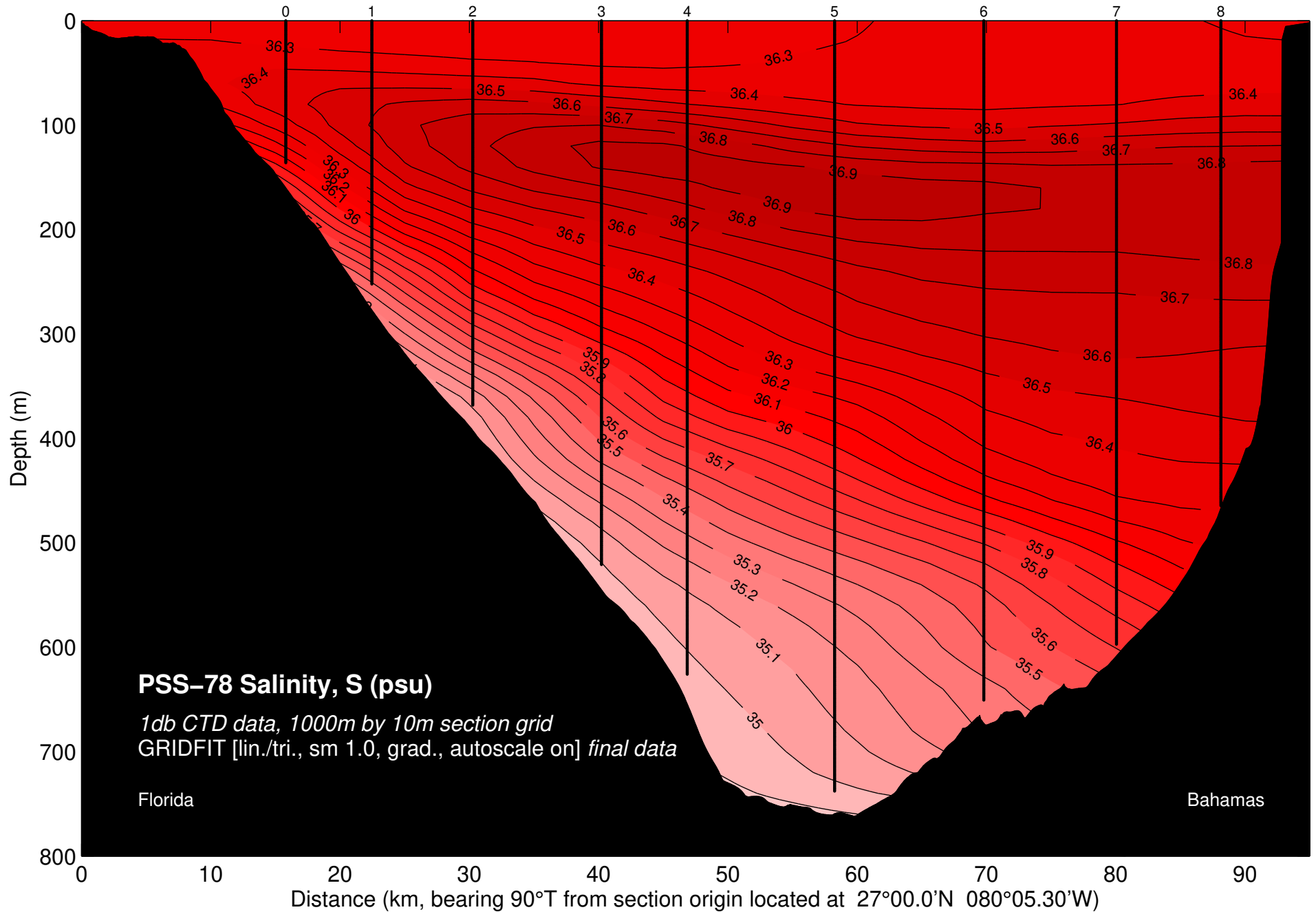
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

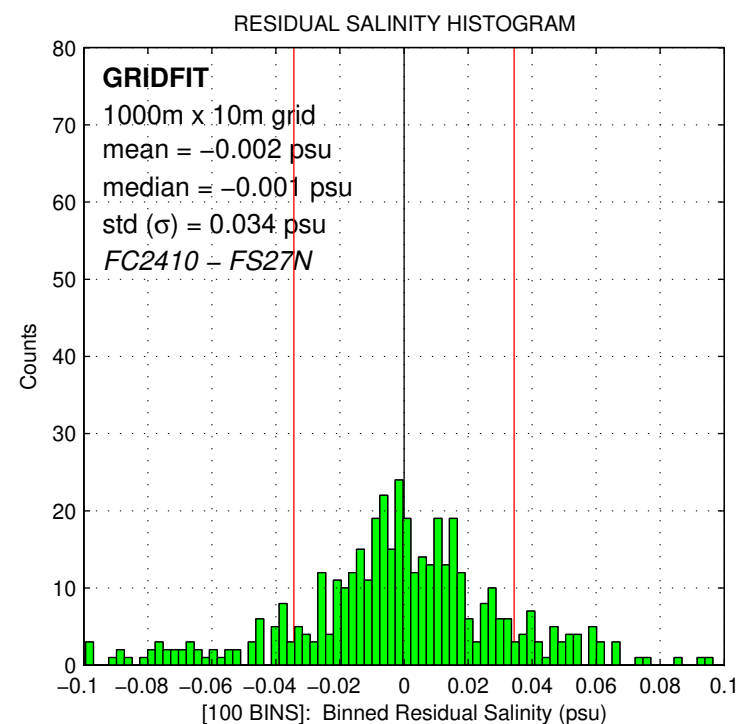
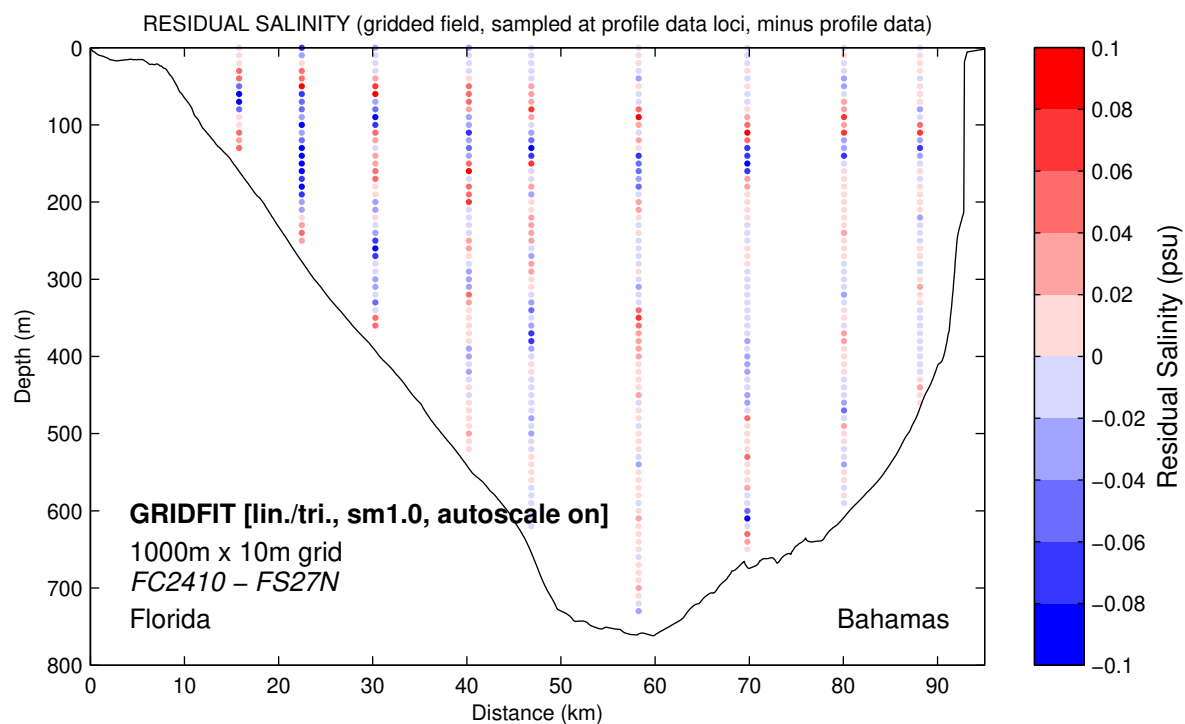
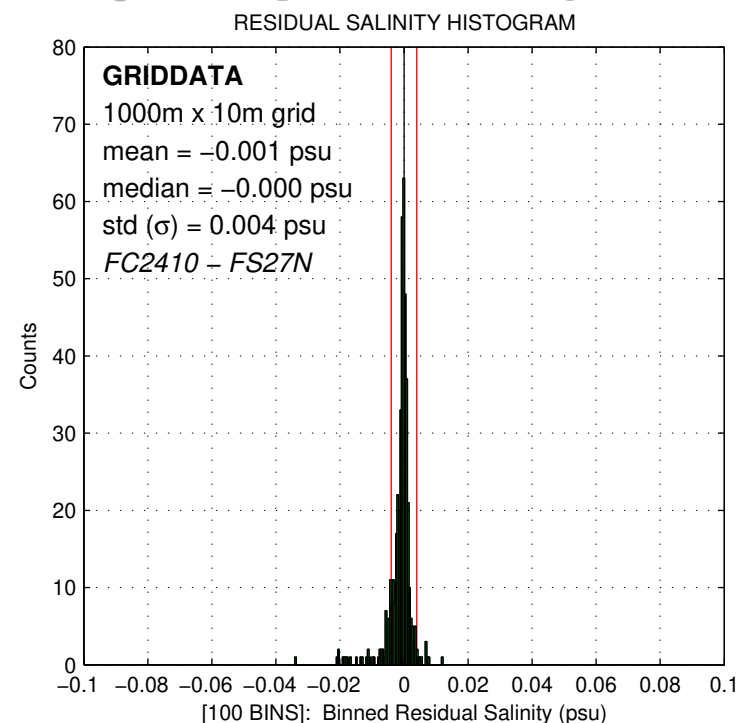
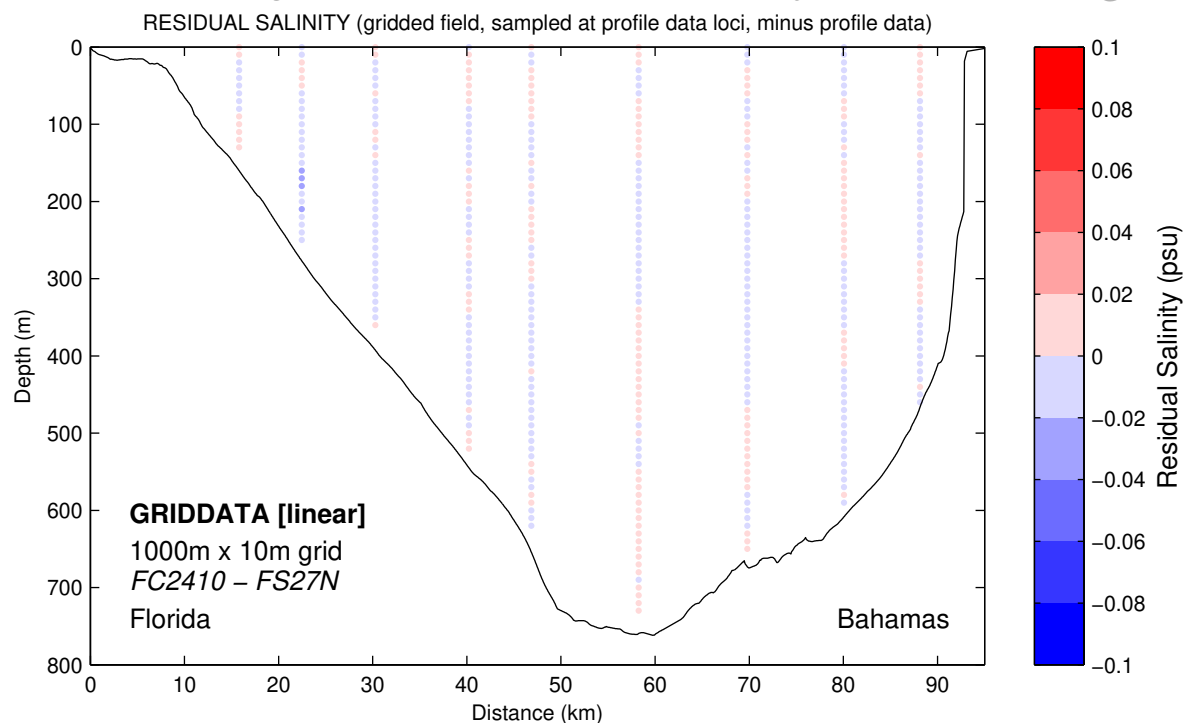


Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

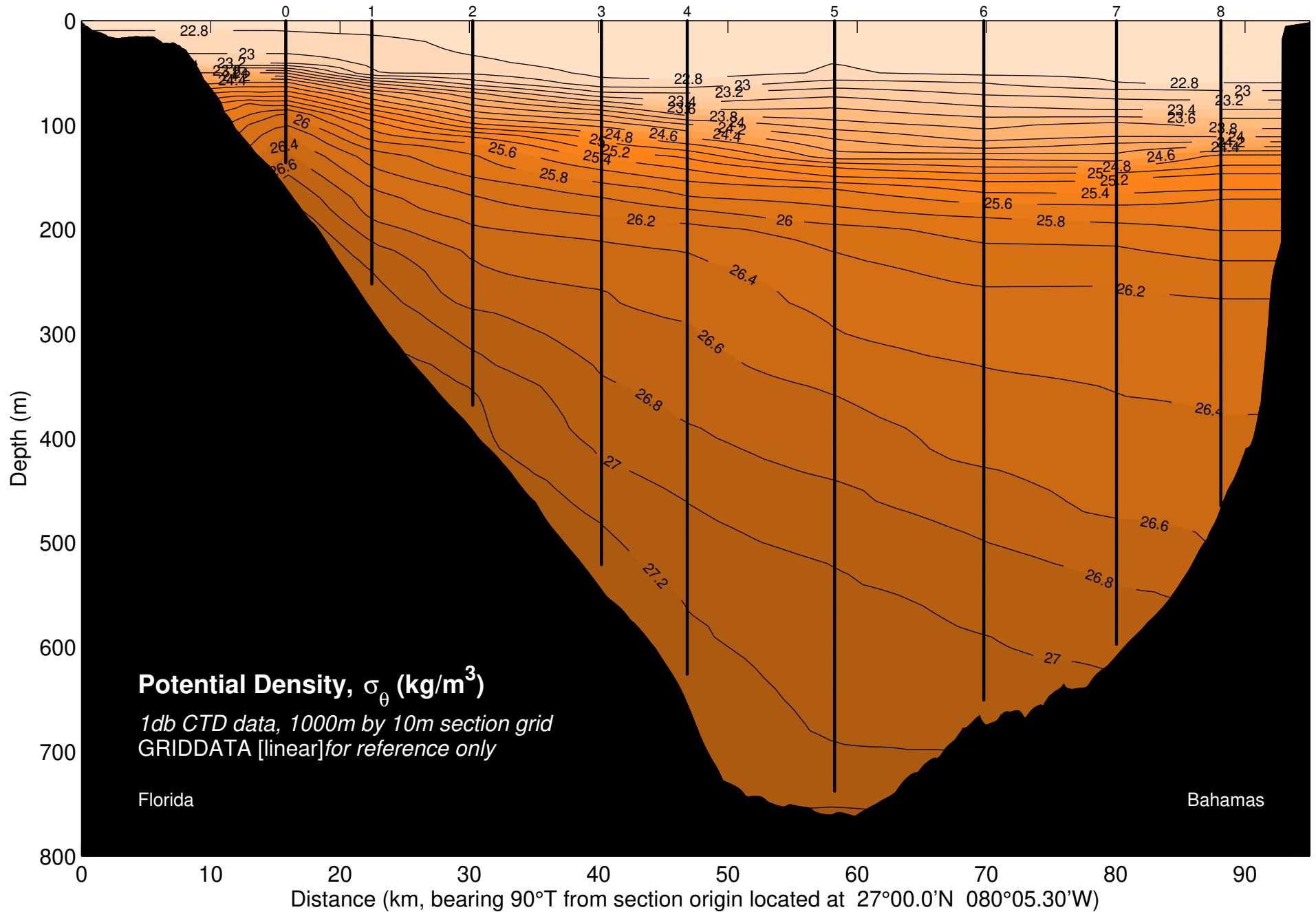


[PAGE 23 of 35] Section Tool Quality: How well do griddata and gridfit represent the original data?



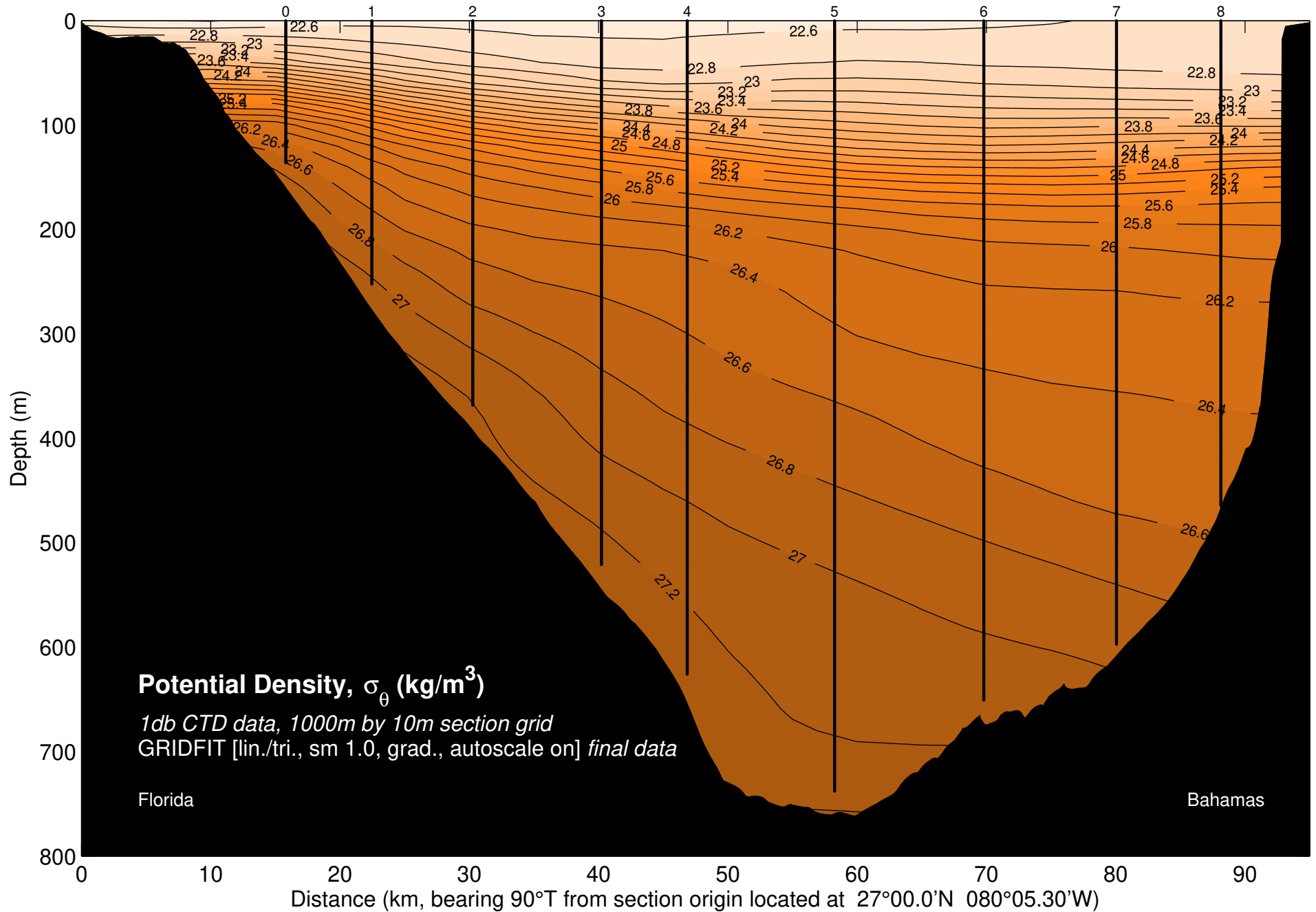
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

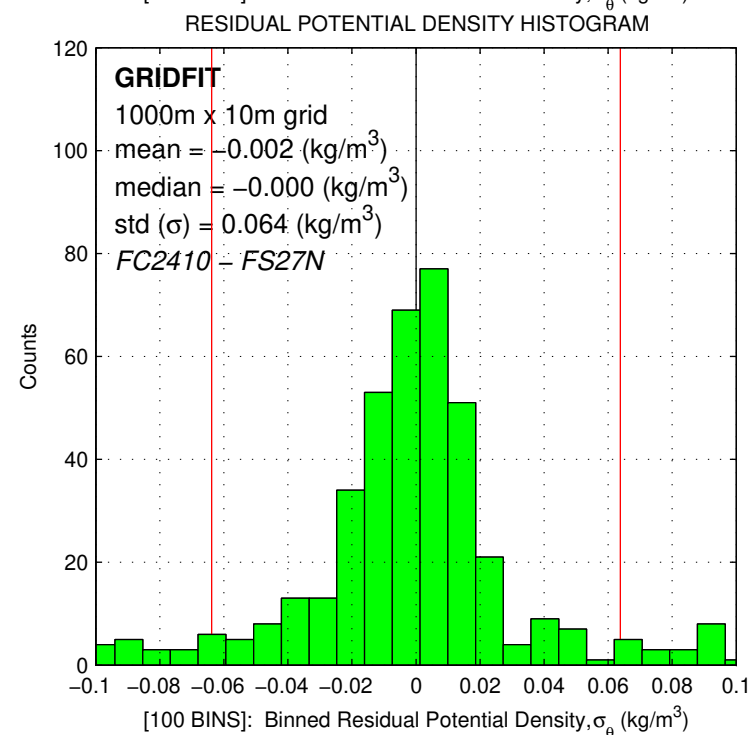
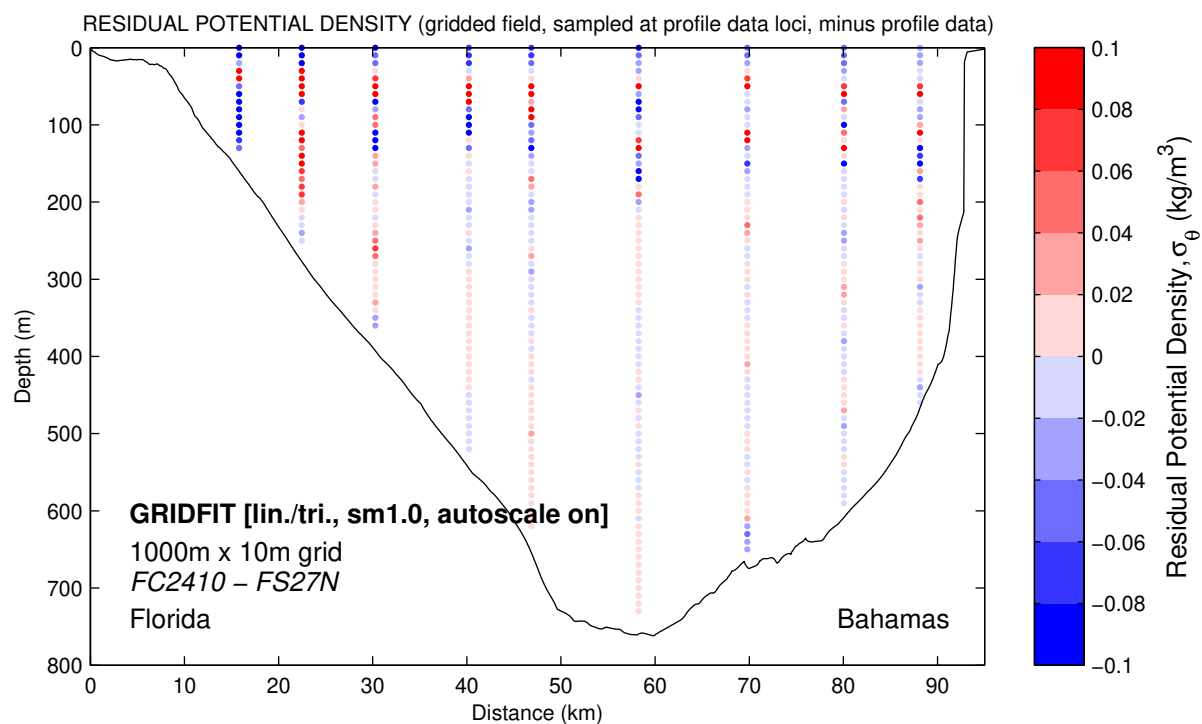
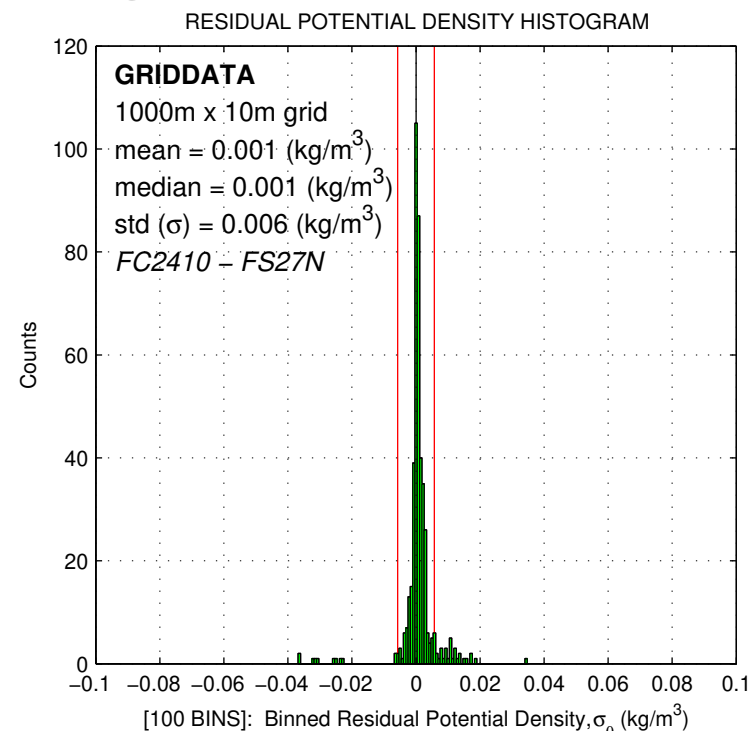
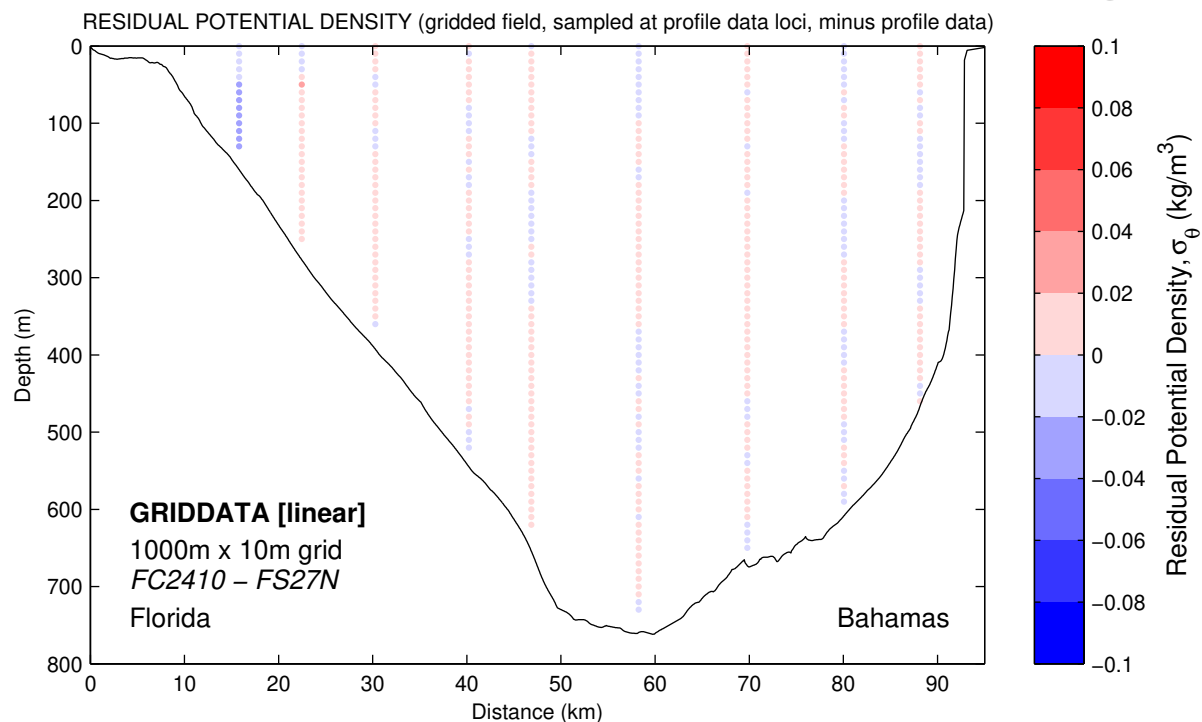


Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

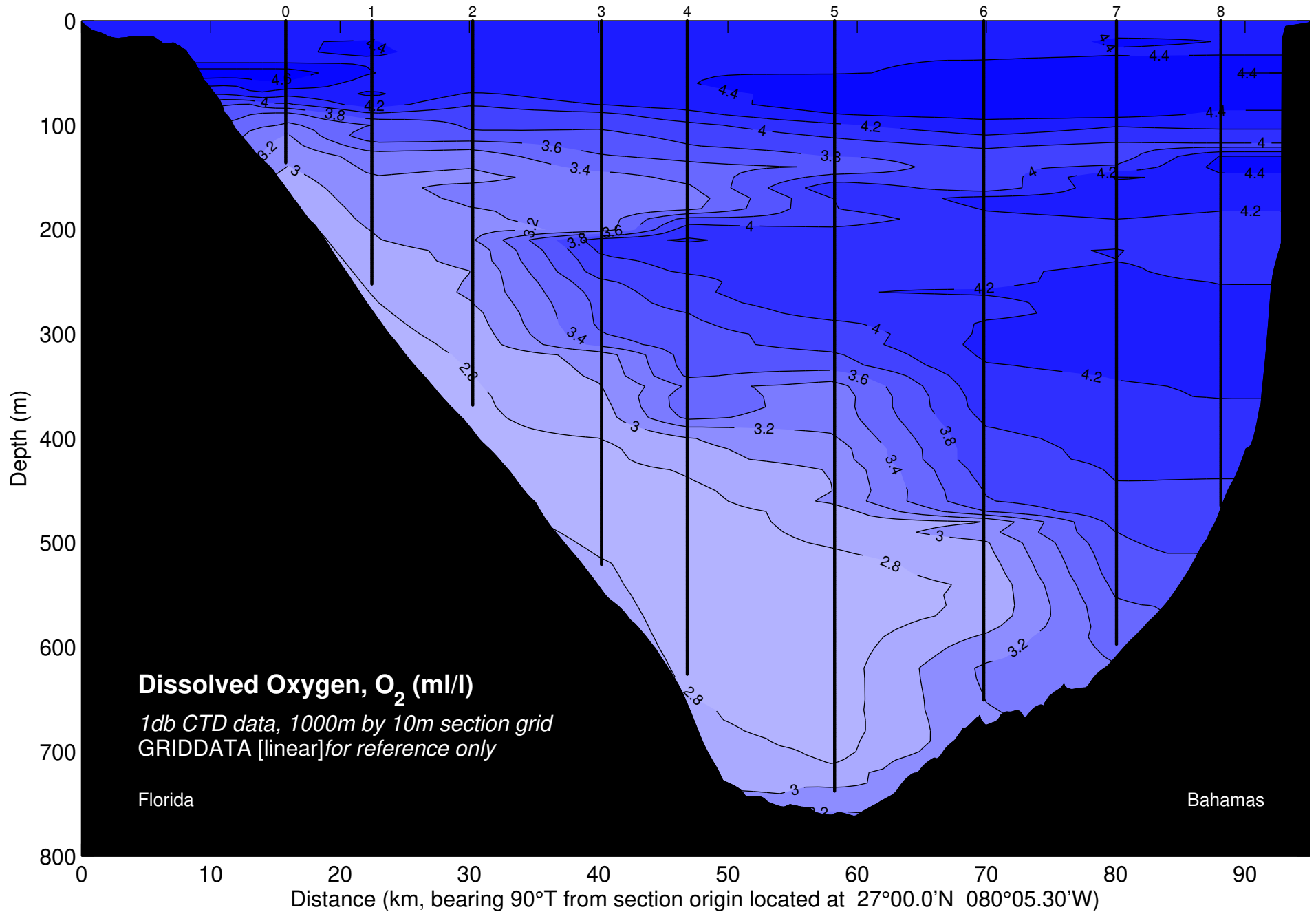


[PAGE 26 of 35] Section Tool Quality: How well do griddata and gridfit represent the original data?



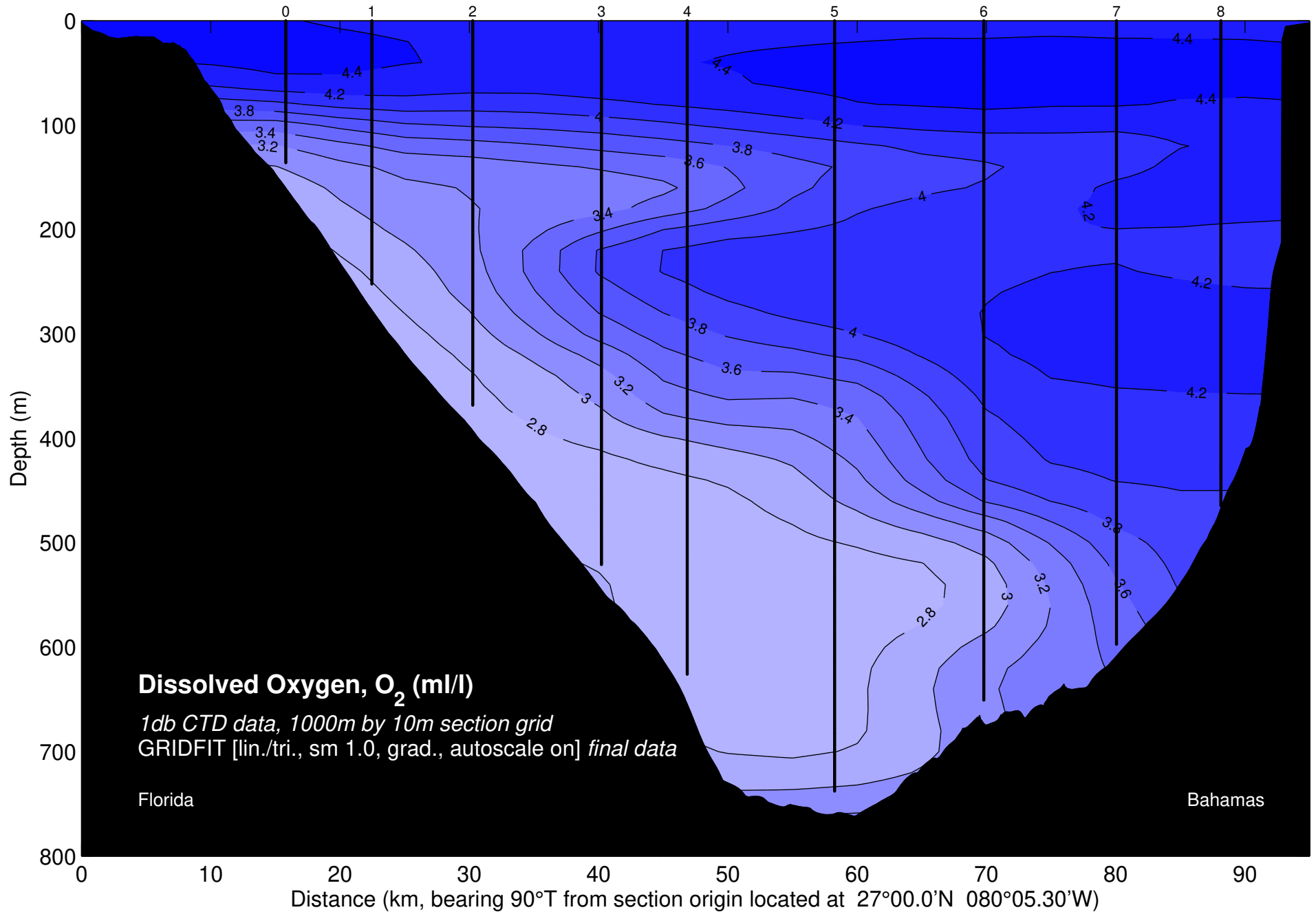
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

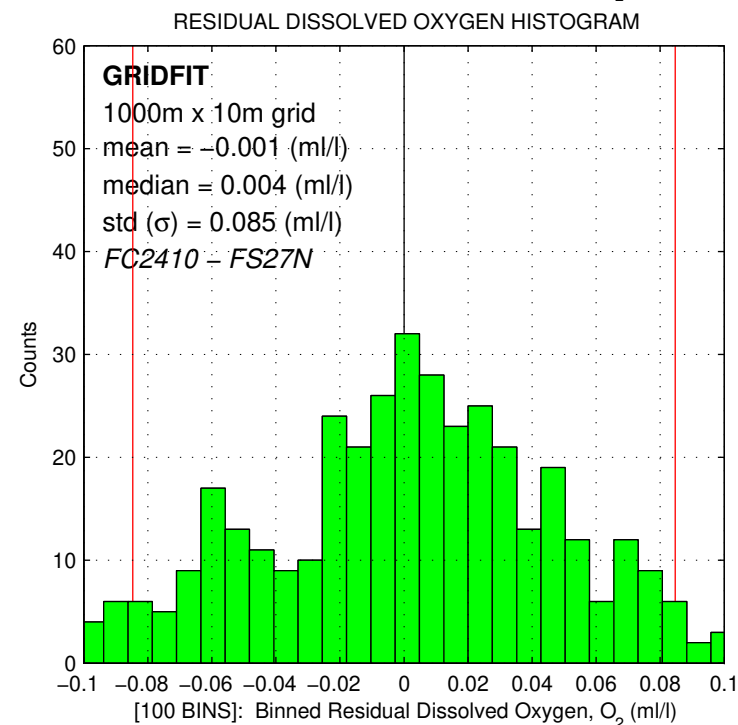
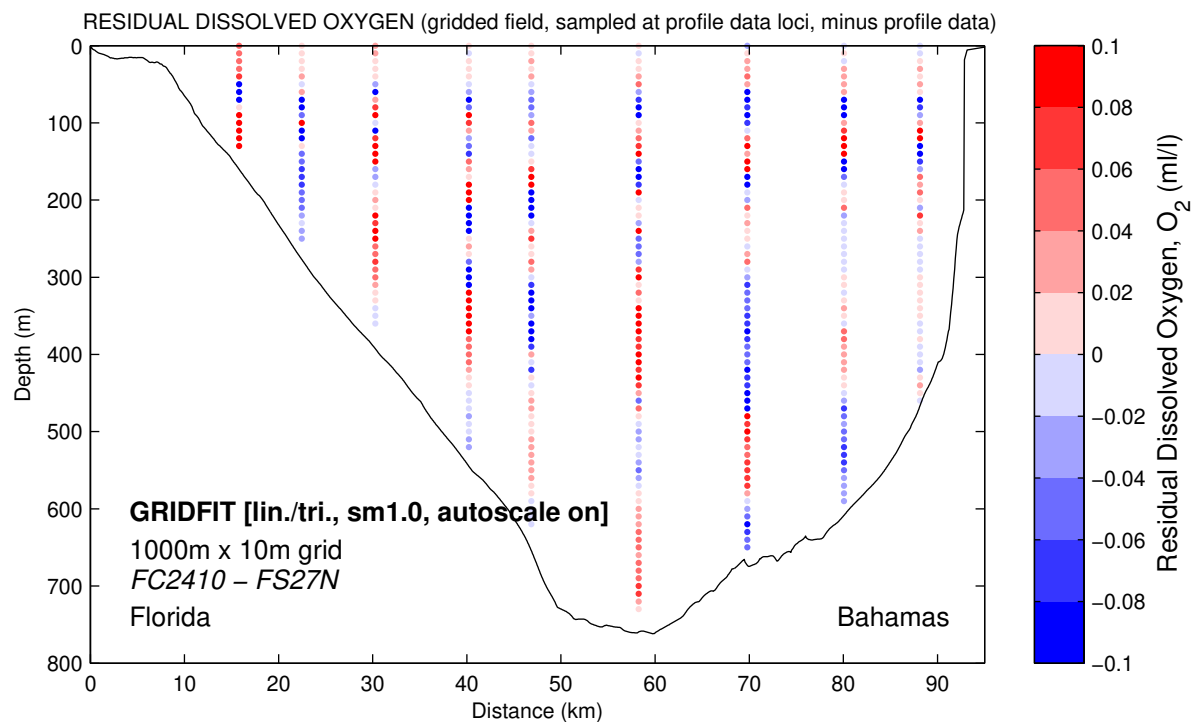
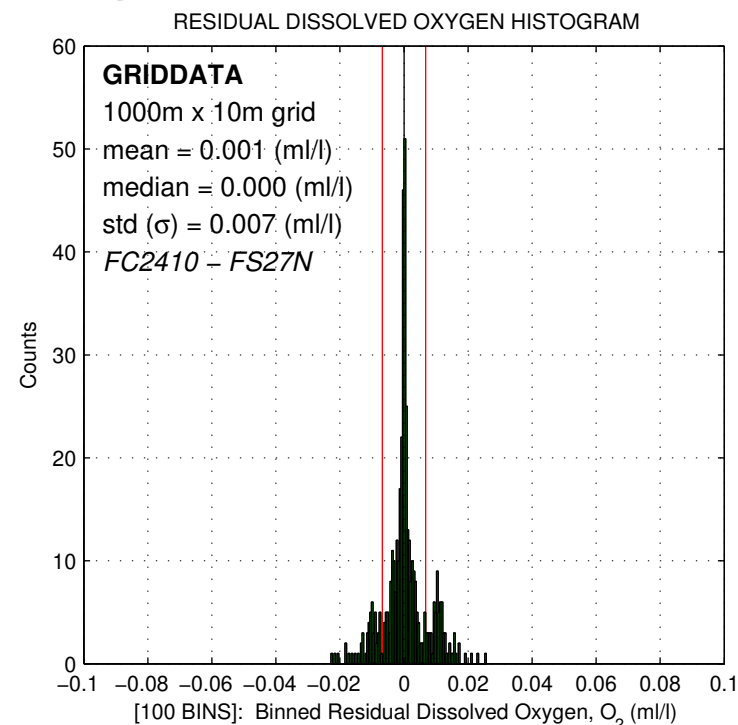
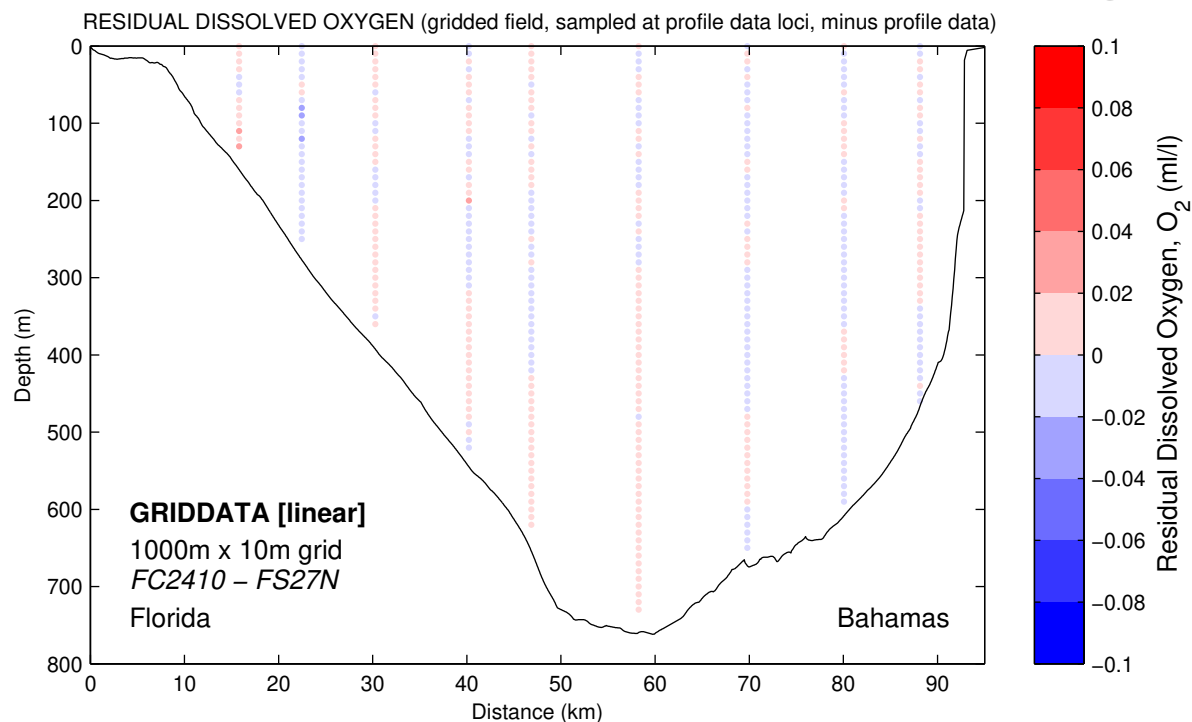


Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

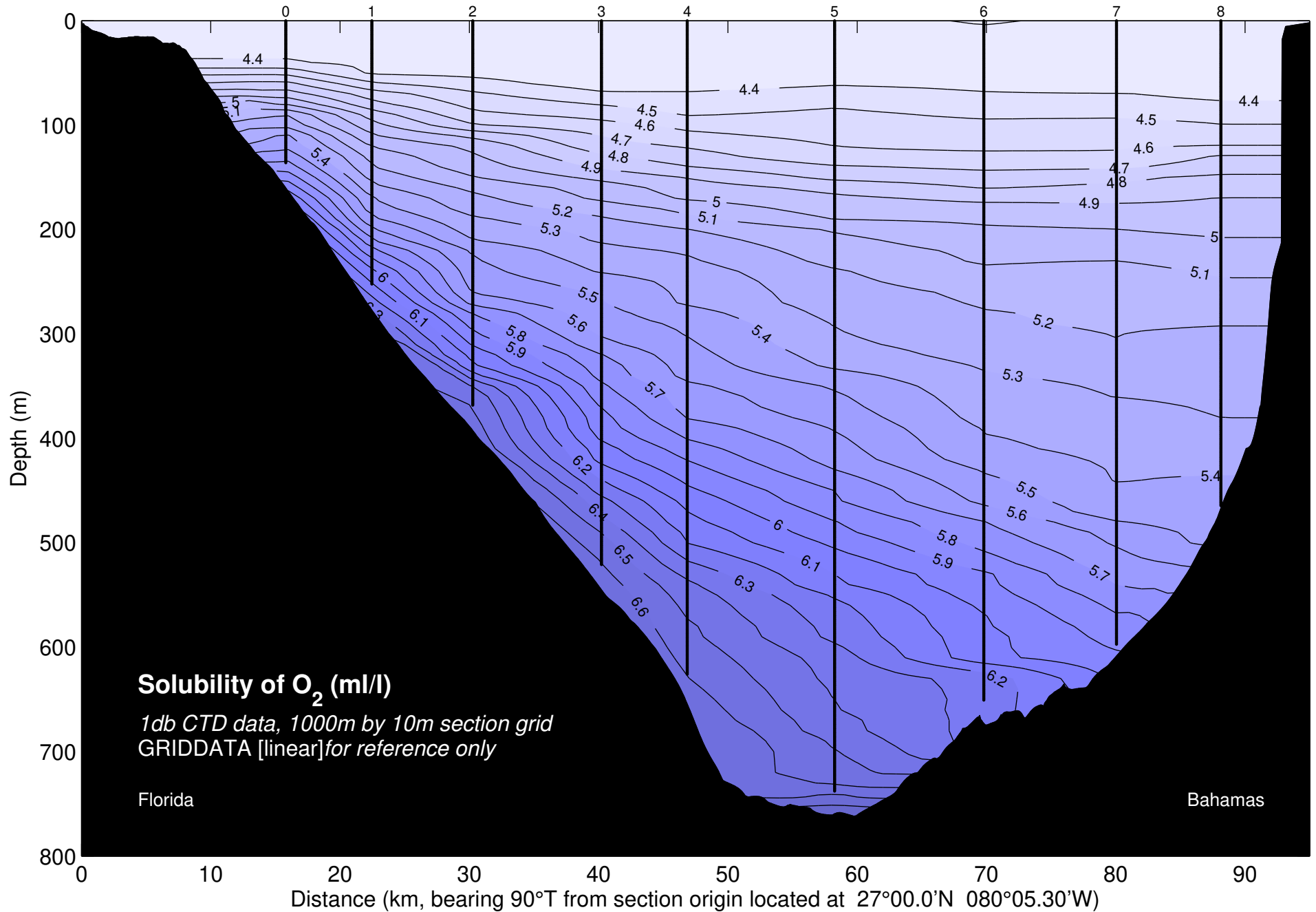


[PAGE 29 of 35] Section Tool Quality: How well do griddata and gridfit represent the original data?



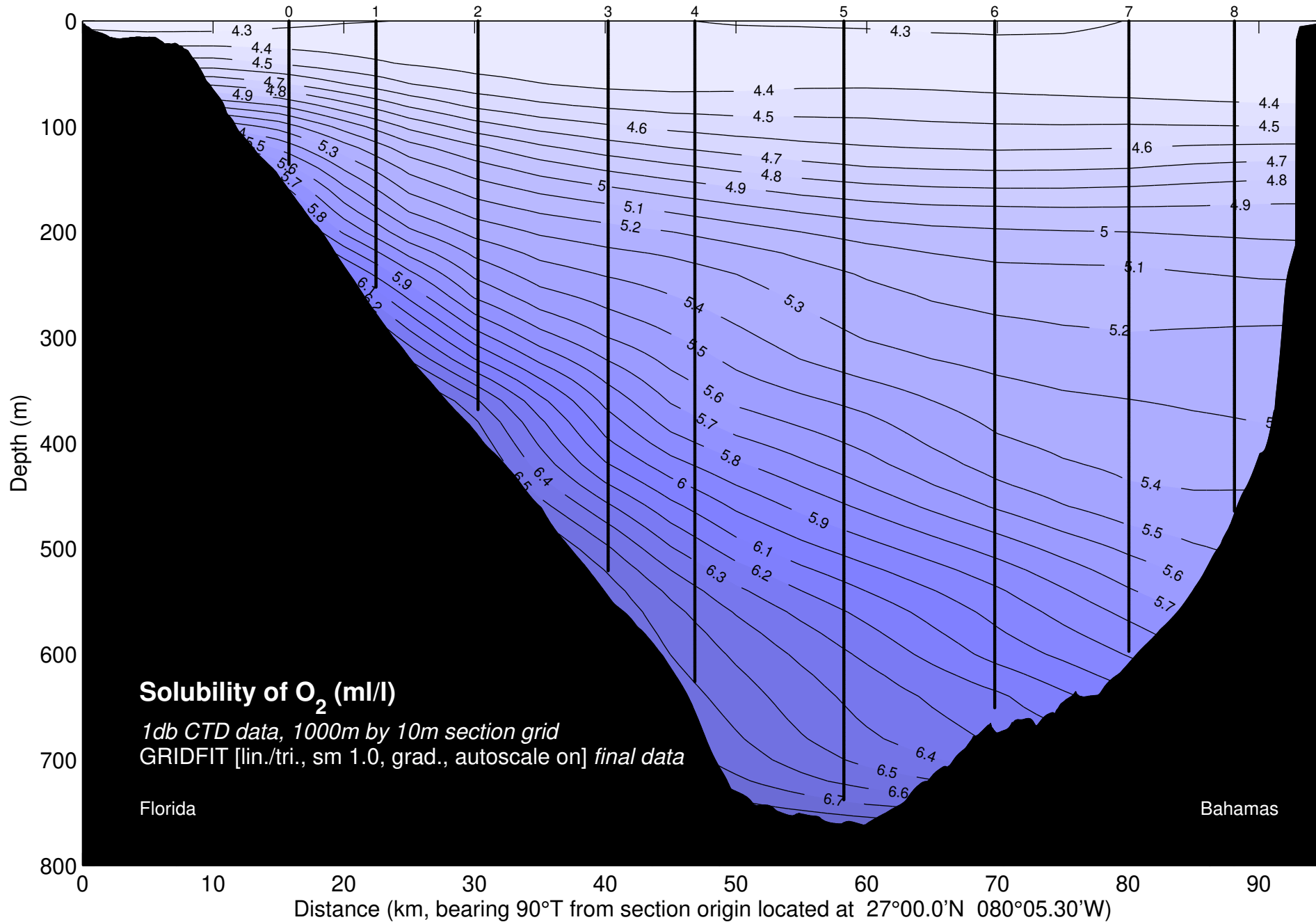
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

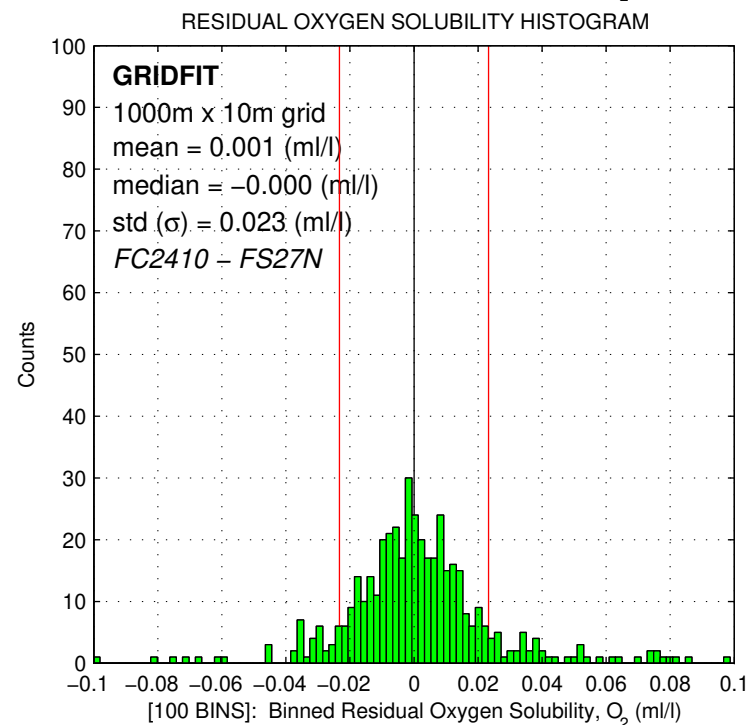
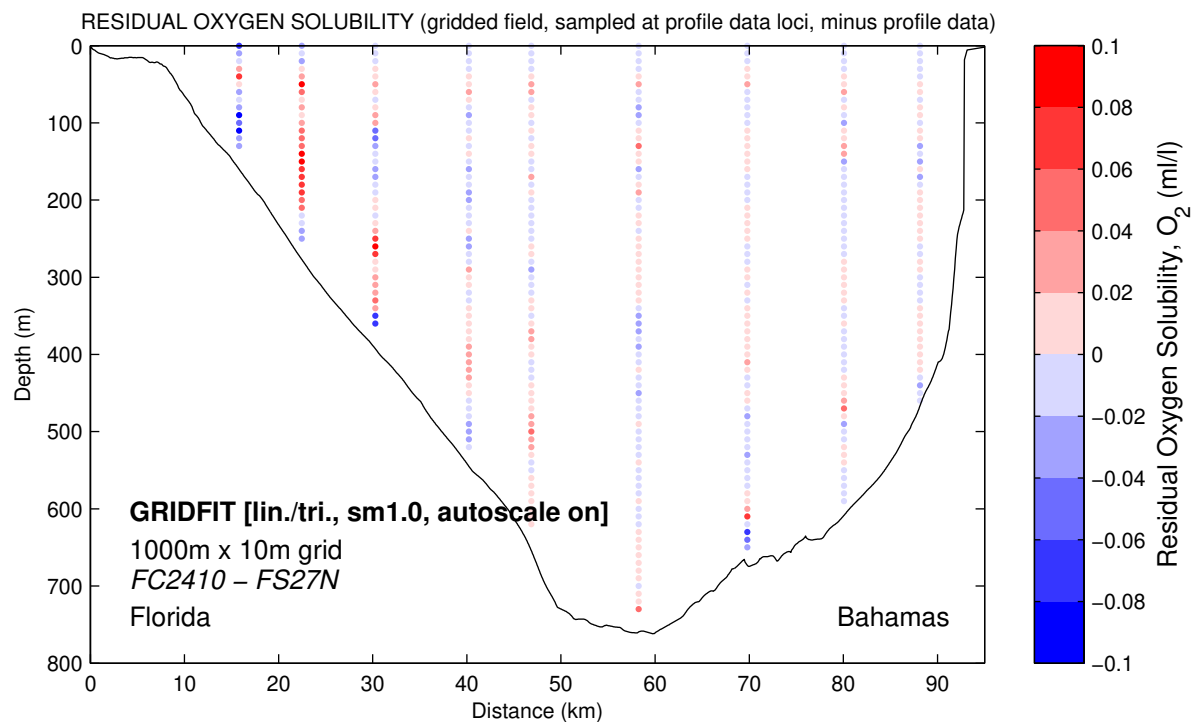
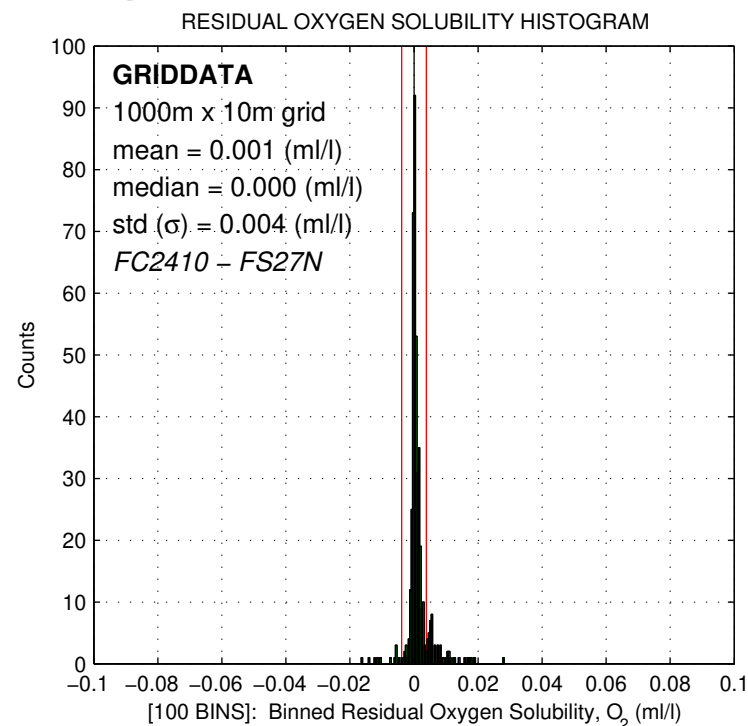
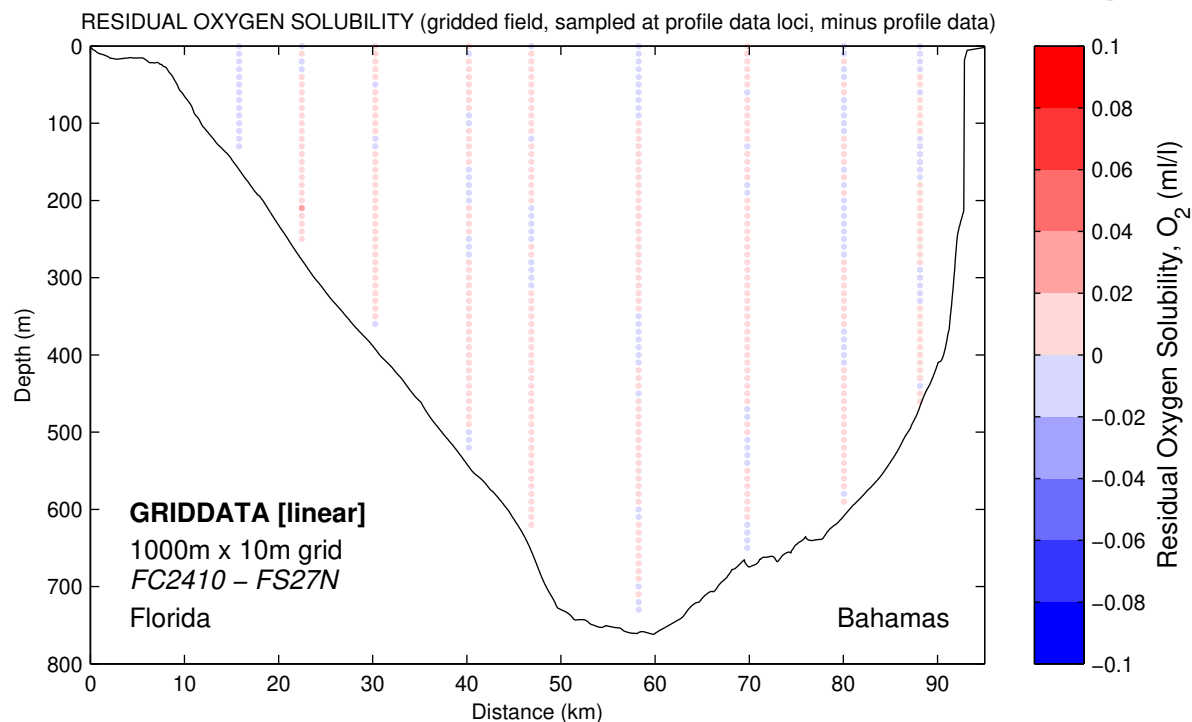


Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

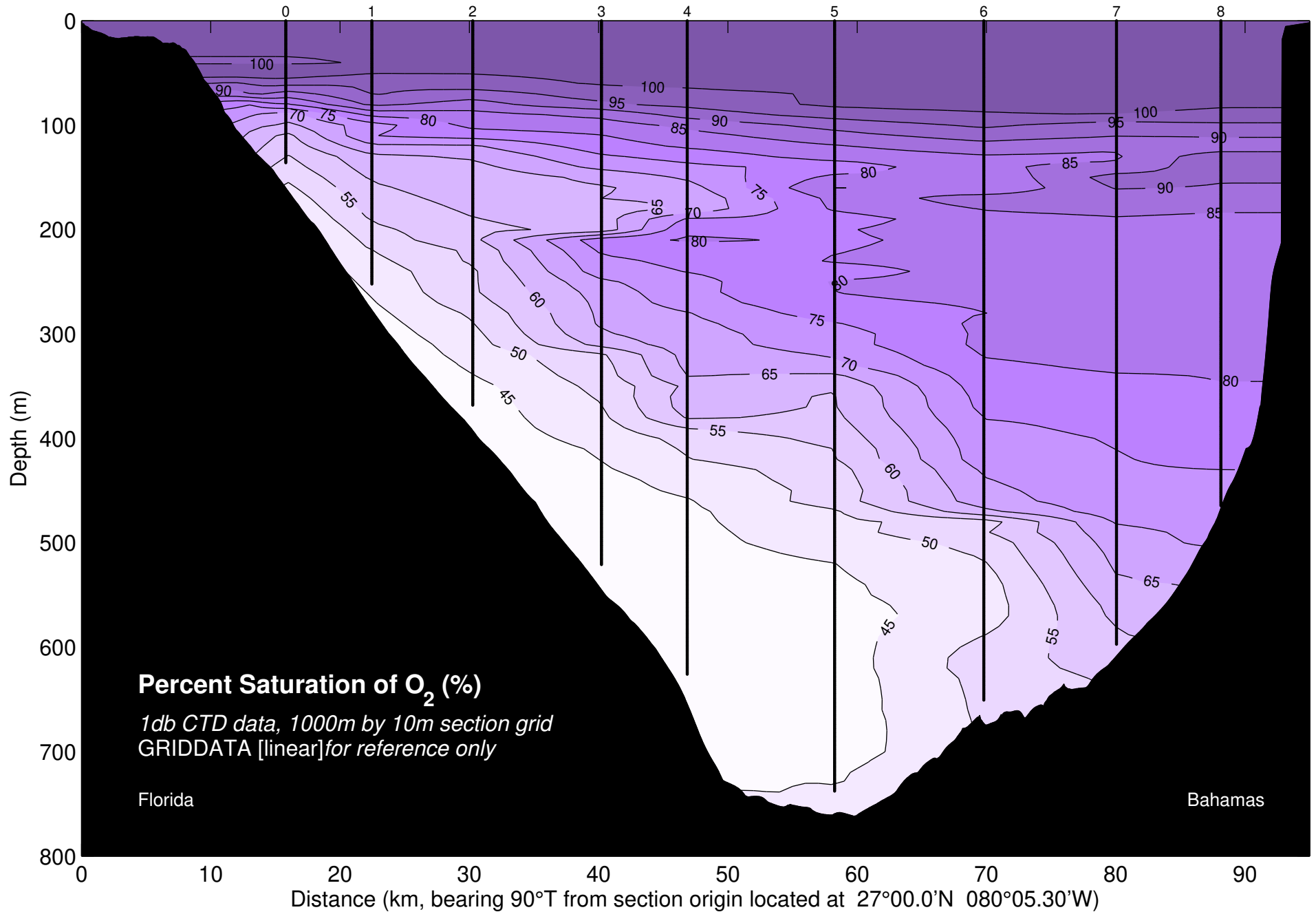


[PAGE 32 of 35] Section Tool Quality: How well do griddata and gridfit represent the original data?



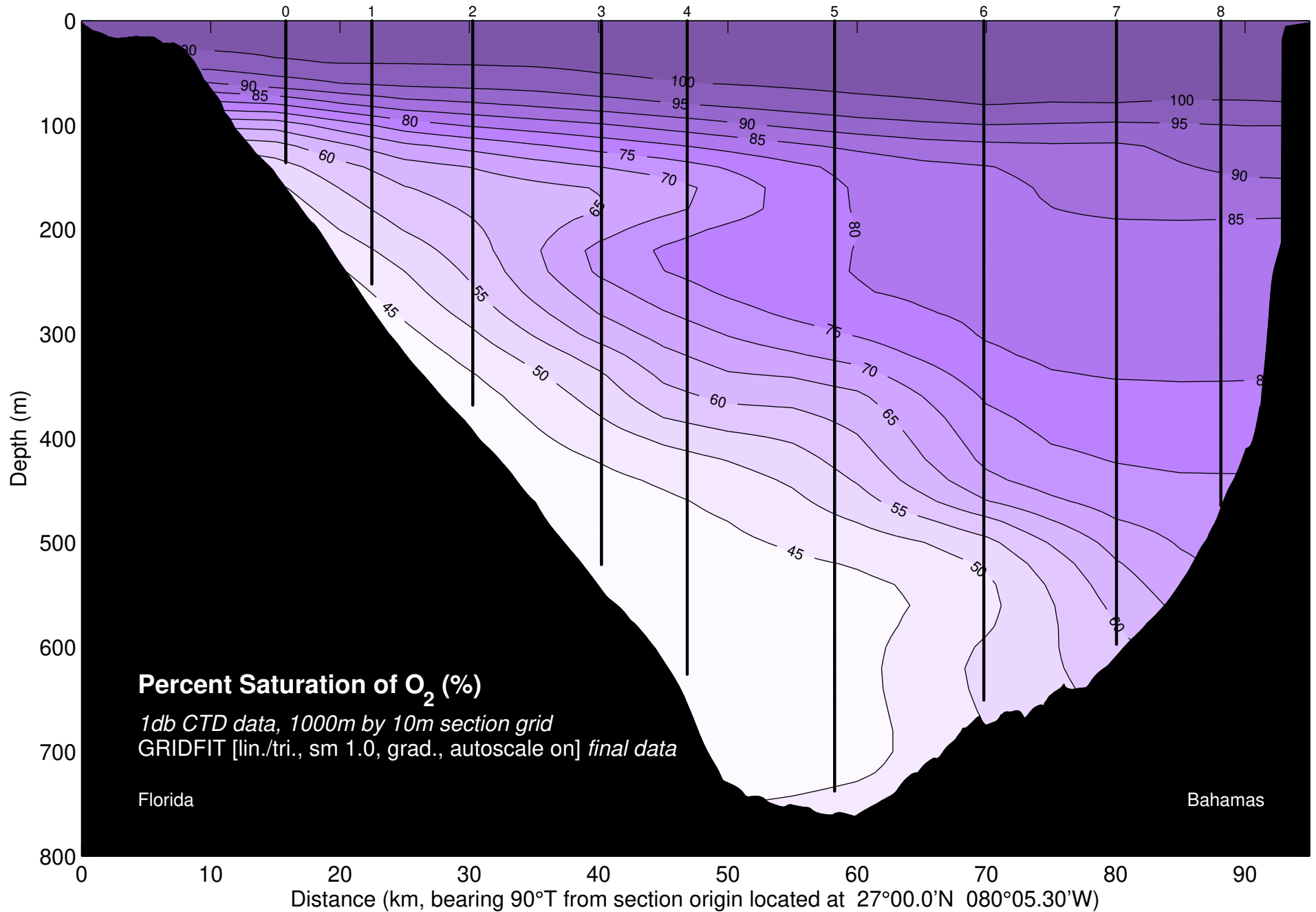
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)



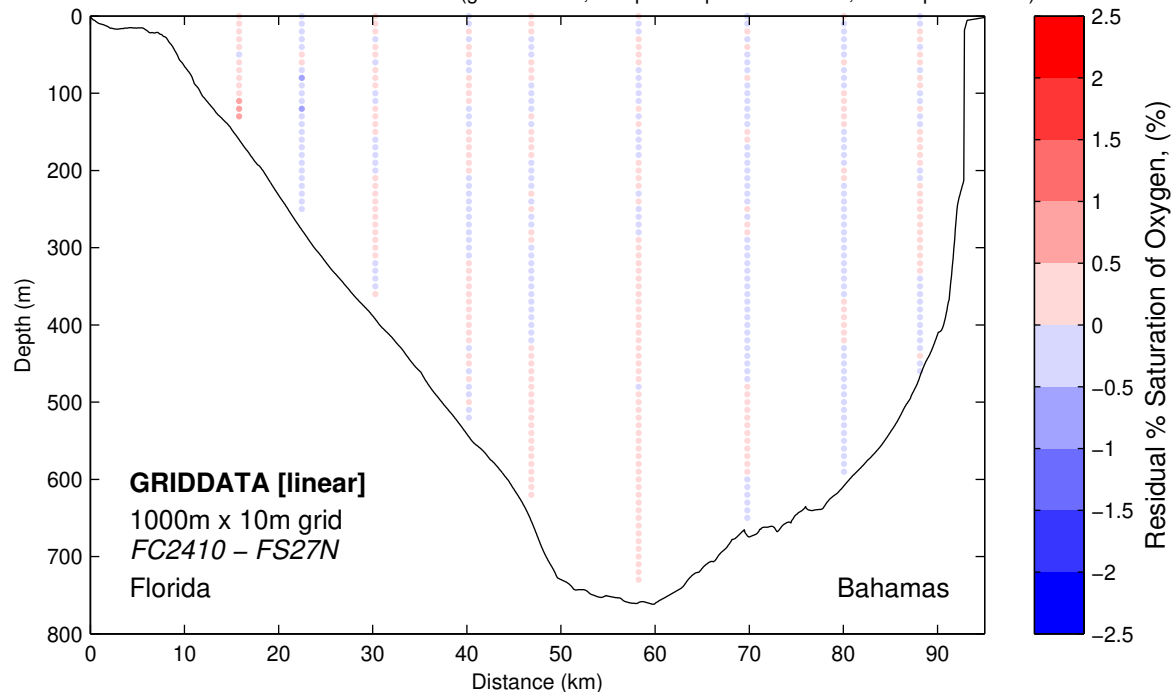
Florida Straits 27°N Section

FC2410 – October 01–02, 2024 (13.3 hour section occupation)

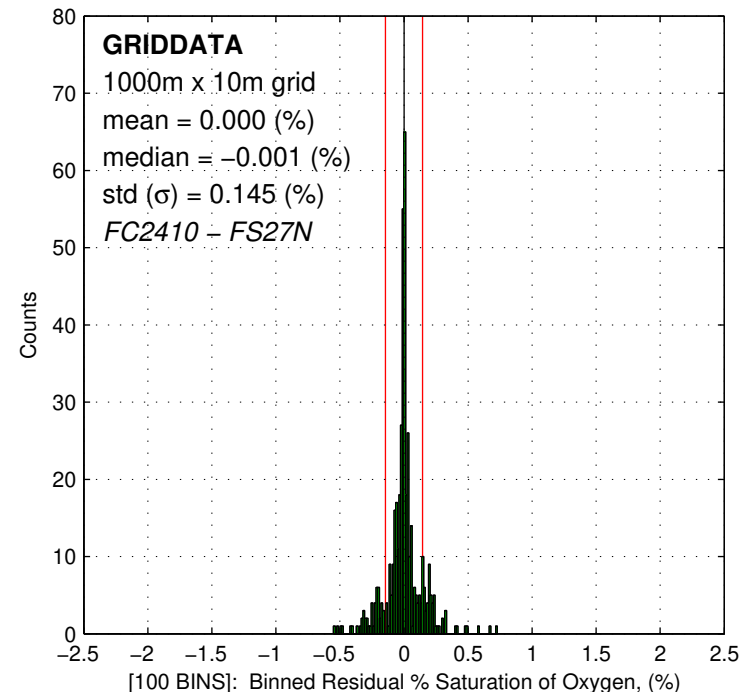


[PAGE 35 of 35] Section Tool Quality: How well do griddata and gridfit represent the original data?

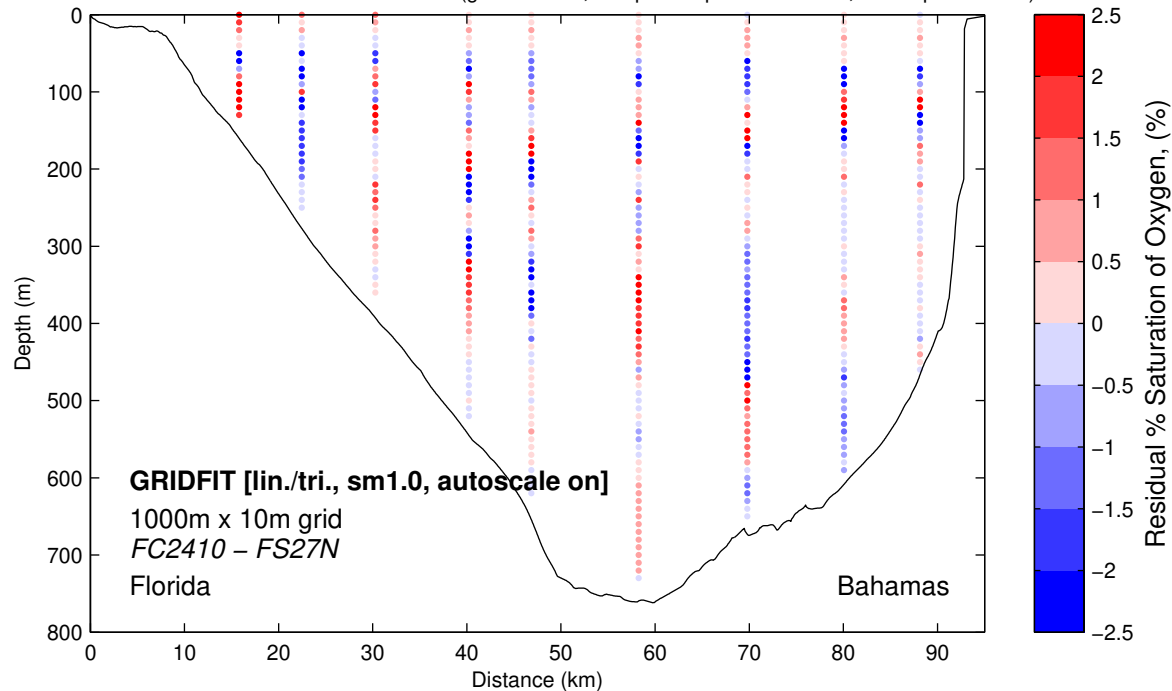
RESIDUAL % SATURATION OF OXYGEN (gridded field, sampled at profile data loci, minus profile data)



RESIDUAL % SATURATION OF OXYGEN HISTOGRAM



RESIDUAL % SATURATION OF OXYGEN (gridded field, sampled at profile data loci, minus profile data)



RESIDUAL % SATURATION OF OXYGEN HISTOGRAM

