

WS0921 – Florida Straits 27°N Section

November 23–24, 2009 (15.5 hour section occupation)

- **9 LADCP velocity profiles** – single WH300 LADCP data
LADCP data processed with Visbeck v10.8 at 10m vertical resolution...
- **185 SADCP velocity profiles** – OS75 SADCP data
SADCP data processed with CODAS3 at 16m (OS75) vertical resolution...
- **1000m by 10m grid resolution** – along-channel 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 = 40.79 km² (94.86%)
- cross-sectional area of boundary (to be extrapolated) = 2.21 km² (5.14%)

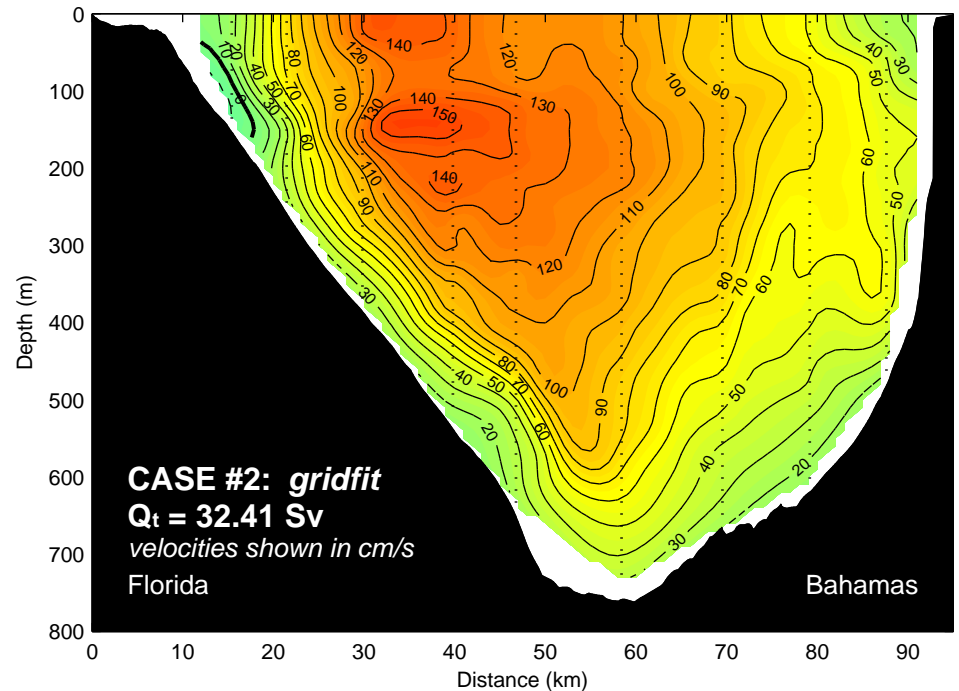
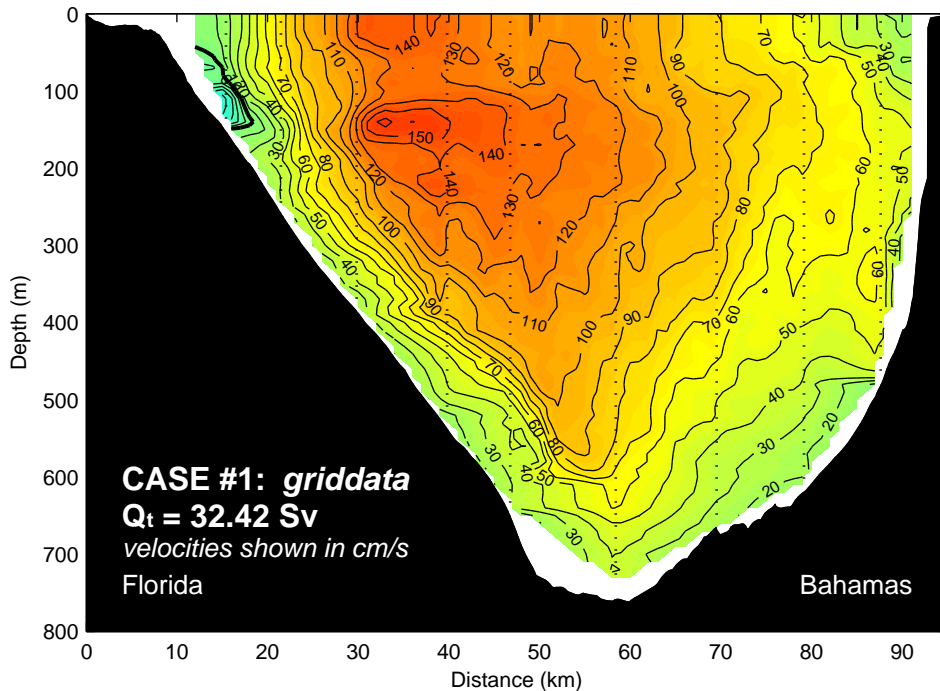
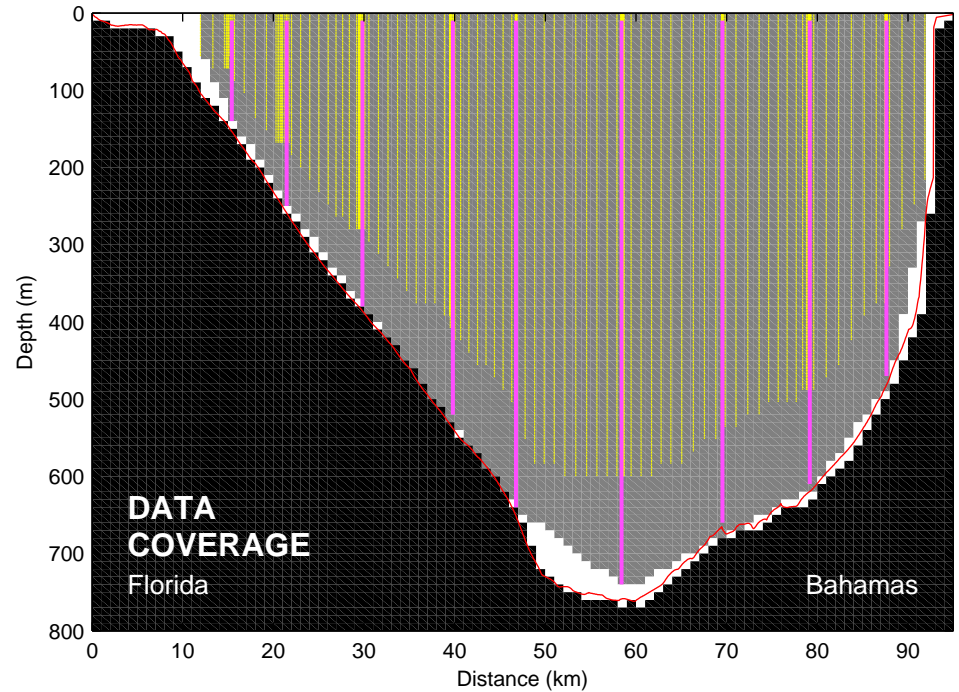
CASE #1: interp. = *griddata* (linear), extrap. = none

- total detided transport (Q_t) = 32.42 Sv (1 Sv = 10⁶m³s⁻¹)
- *griddata* is a true interpolant (exactly predicts all supplied data)*

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

- total detided transport (Q_t) = 32.41 Sv
- *gridfit* is NOT a true interpolant (simulates behavior of supplied data)

CASE #1 Q_t – CASE #2 Q_t = 0.01 Sv (transport difference)



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Grid Interpolation and Boundary Extrapolation:

- total cross-sectional area = 43.00 km² (percent total area = 100%)
- cross-sectional area of gridded velocity field = 40.79 km² (94.86%)
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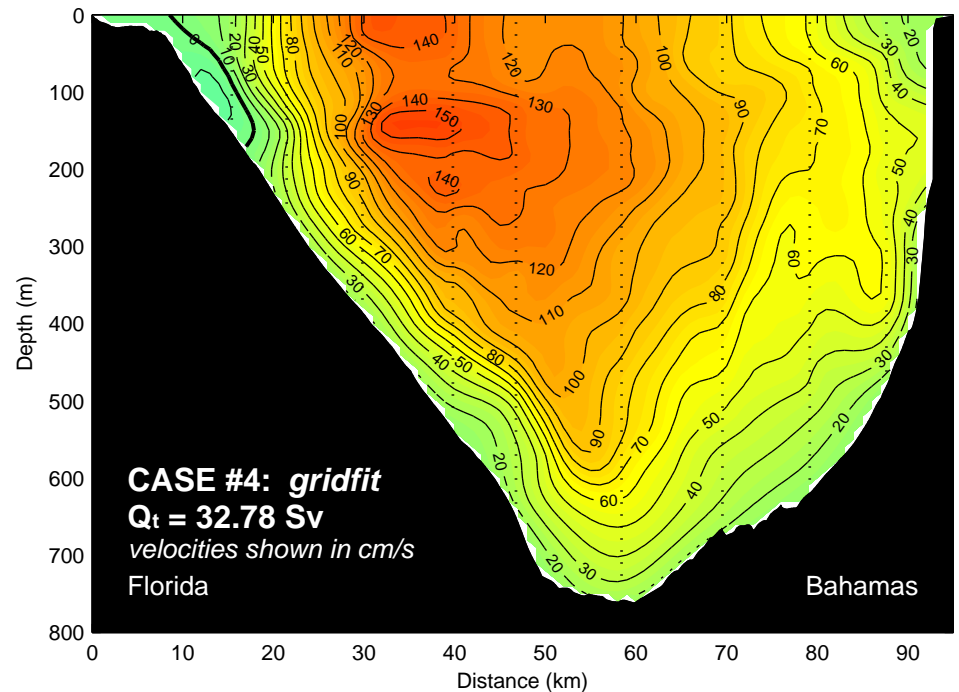
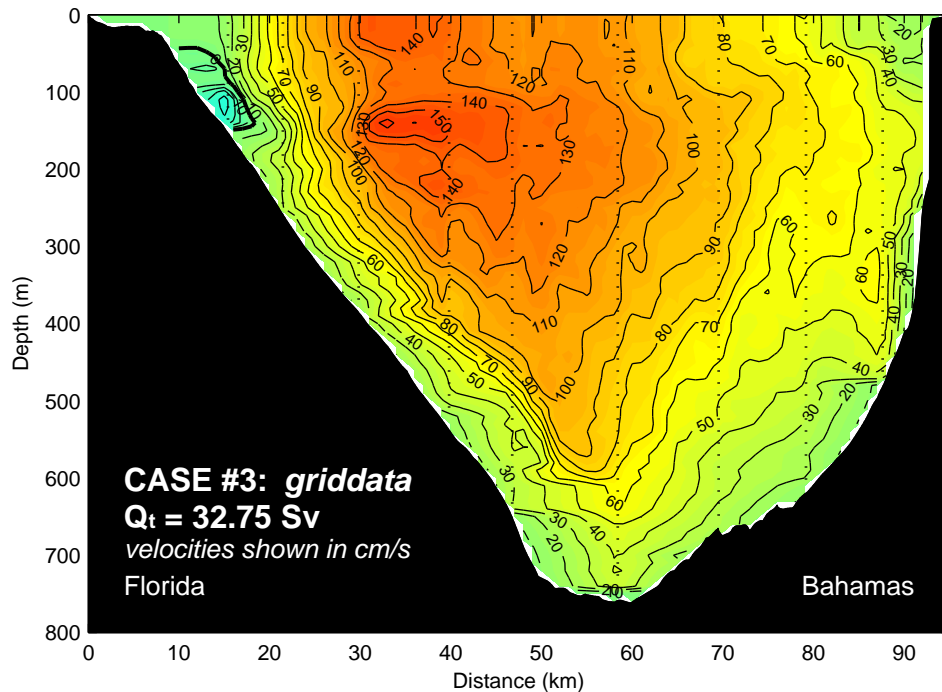
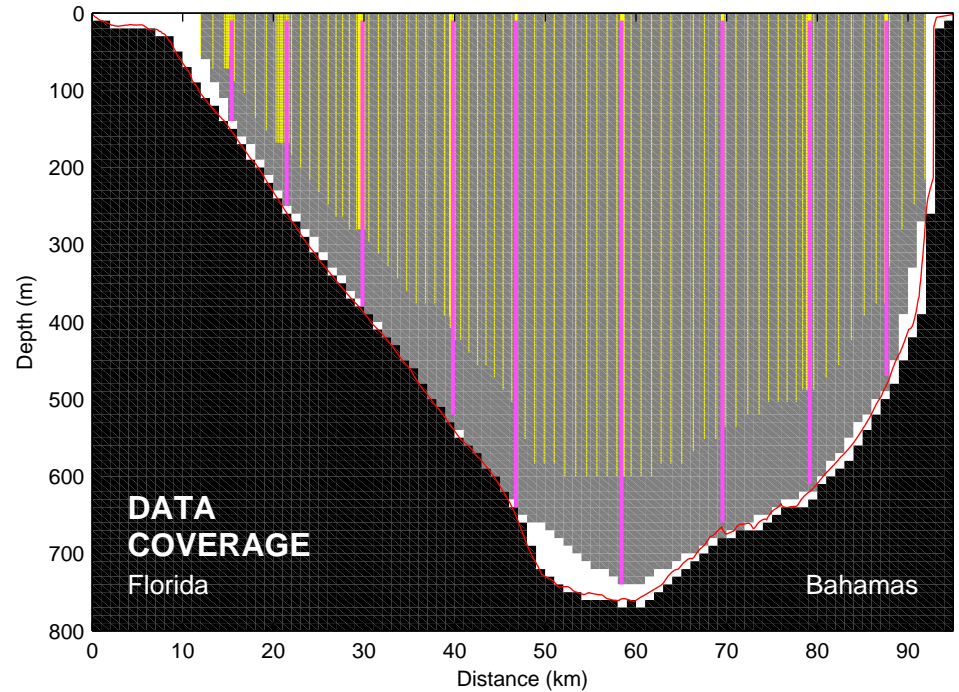
CASE #3: interp. and extrap. = *griddata* (linear)

- total detided transport (Q_t) = 32.75 Sv (1 Sv = 10⁶m³s⁻¹)
- extrapolated boundary transport contribution = 0.34 Sv

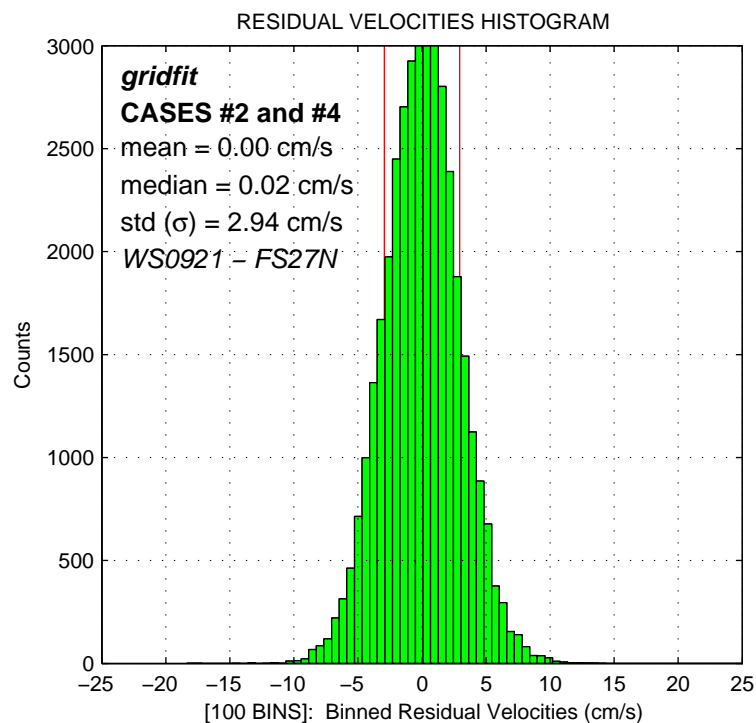
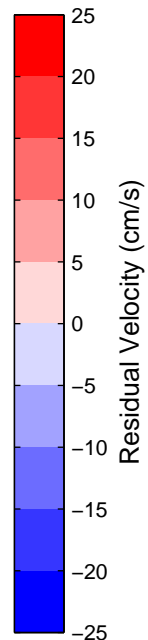
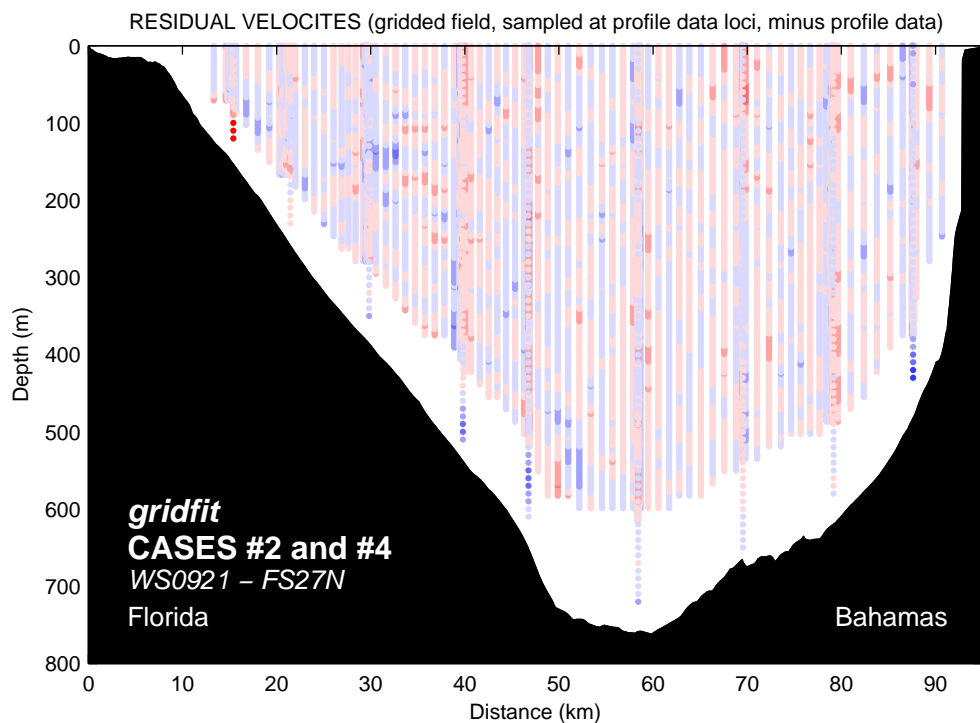
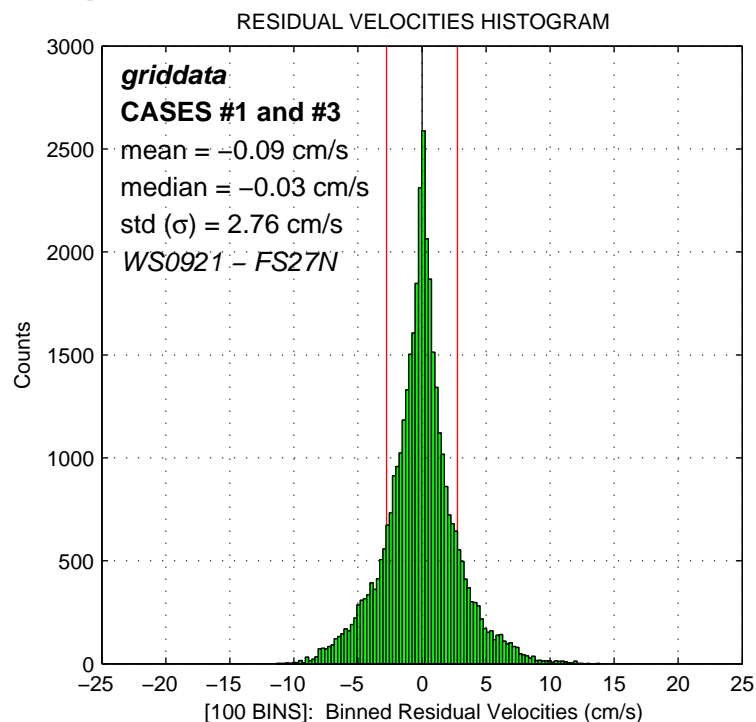
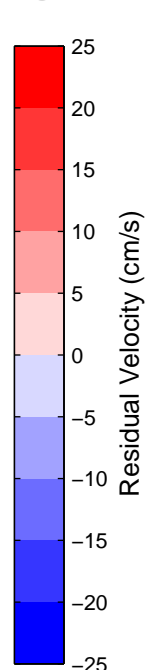
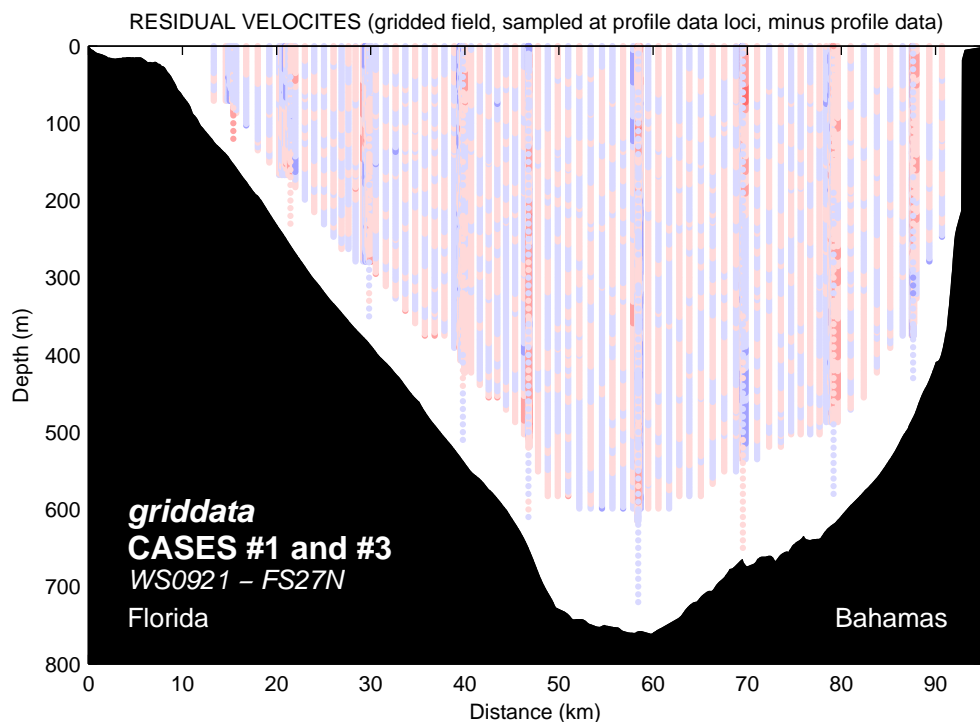
CASE #4: interp. and extrap. = *gridfit* (bilinear, smoothing = 0.4)

- total detided transport (Q_t) = 32.78 Sv
- extrapolated boundary transport contribution = 0.37 Sv

CASE #3 Q_t – CASE #4 Q_t = -0.03 Sv (transport difference)



[PAGE 3 of 4] Section Tool Quality: How well do griddata and gridfit represent the original data?



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