

# NISKINE EM Float Microstructure Summary

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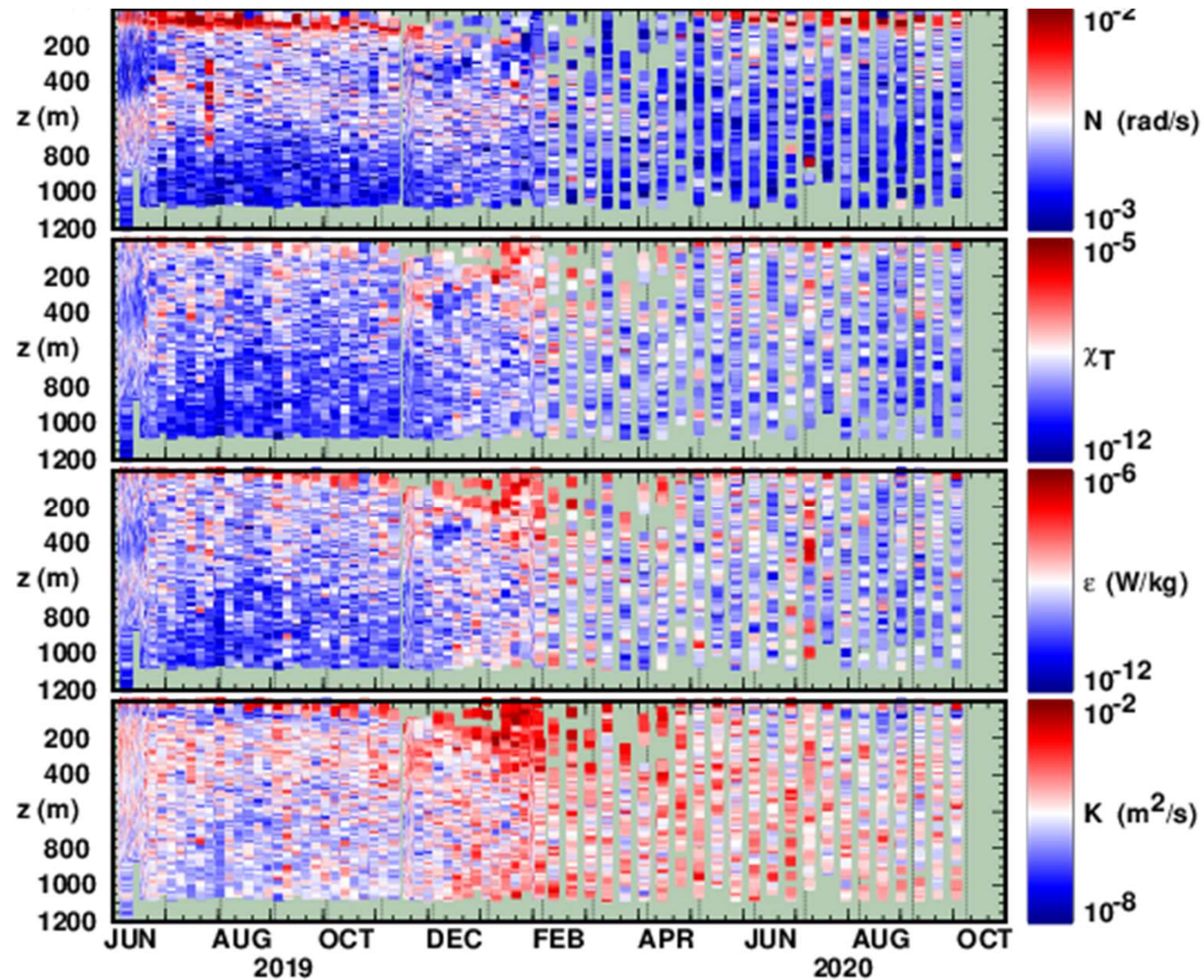
15 chi-augmented EM-APEX floats deployed on 3 occasions during JUN 2019 process cruise, 6 left behind for extended sampling. 3 reporting in as of OCT but last with working microstructure was over a month ago.

Measured  $\chi$  used to infer thermal diffusivity  $K_T$  and TKE dissipation rate  $\varepsilon$  following Osborn and Cox (1971) and Osborn (1980).

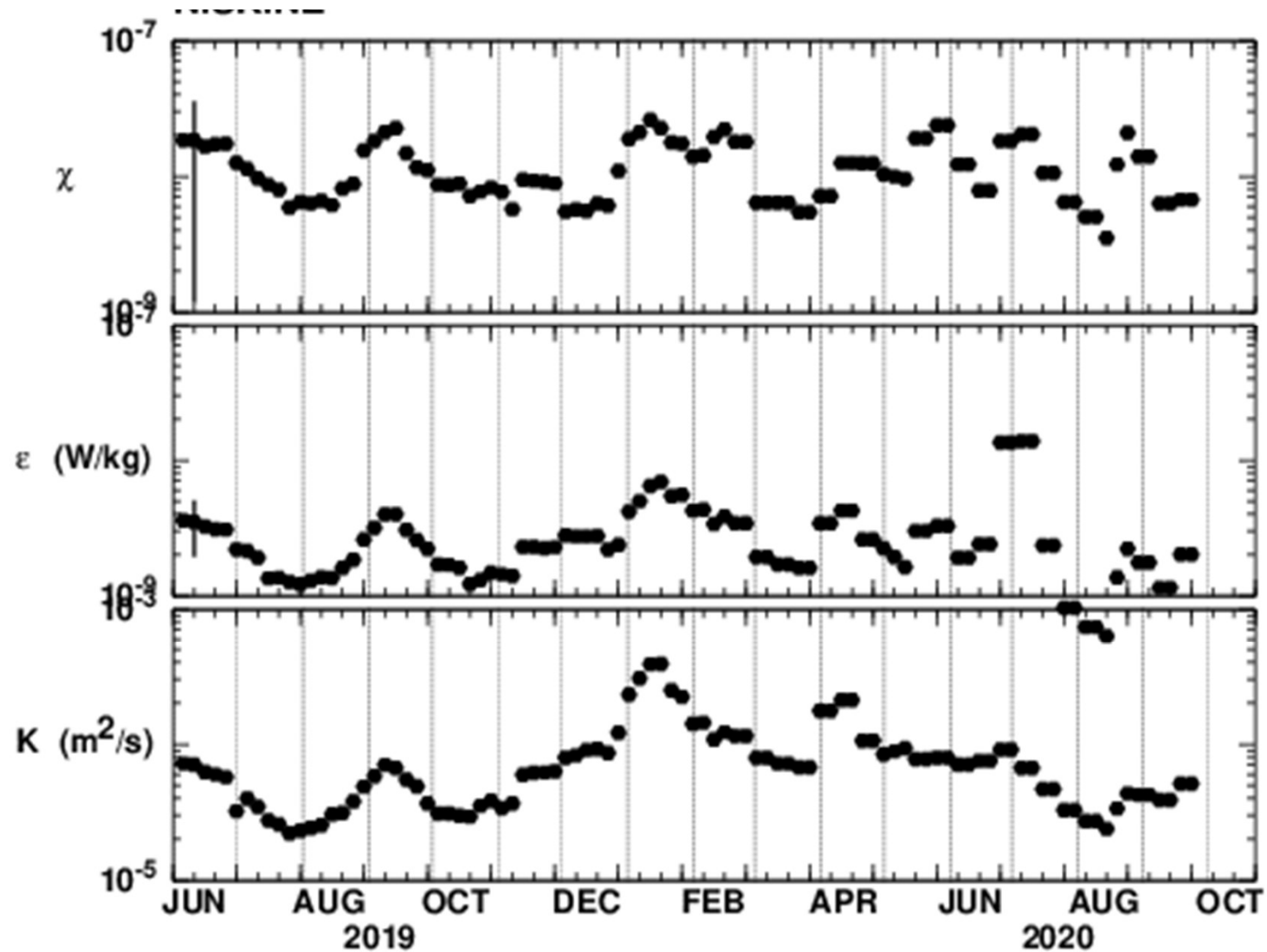
Data excluded if  $N^2 < 4f^2$  or  $T_z < 2 \times 10^{-3}$  C/m or if the 2  $\chi$ 's did not agree to within a factor of 2. Outliers with  $X > 10^{-5}$  C<sup>2</sup>/s,  $\varepsilon > 10^{-6}$  W/kg and  $K_T > 10^{-2}$  m<sup>2</sup>/s also excluded.

Mean float dissipation rates  $\varepsilon = (1.3-4.0) \times 10^{-9}$  W/kg and thermal diffusivities  $K_T = (0.3-0.8) \times 10^{-4}$  m<sup>2</sup>/s.

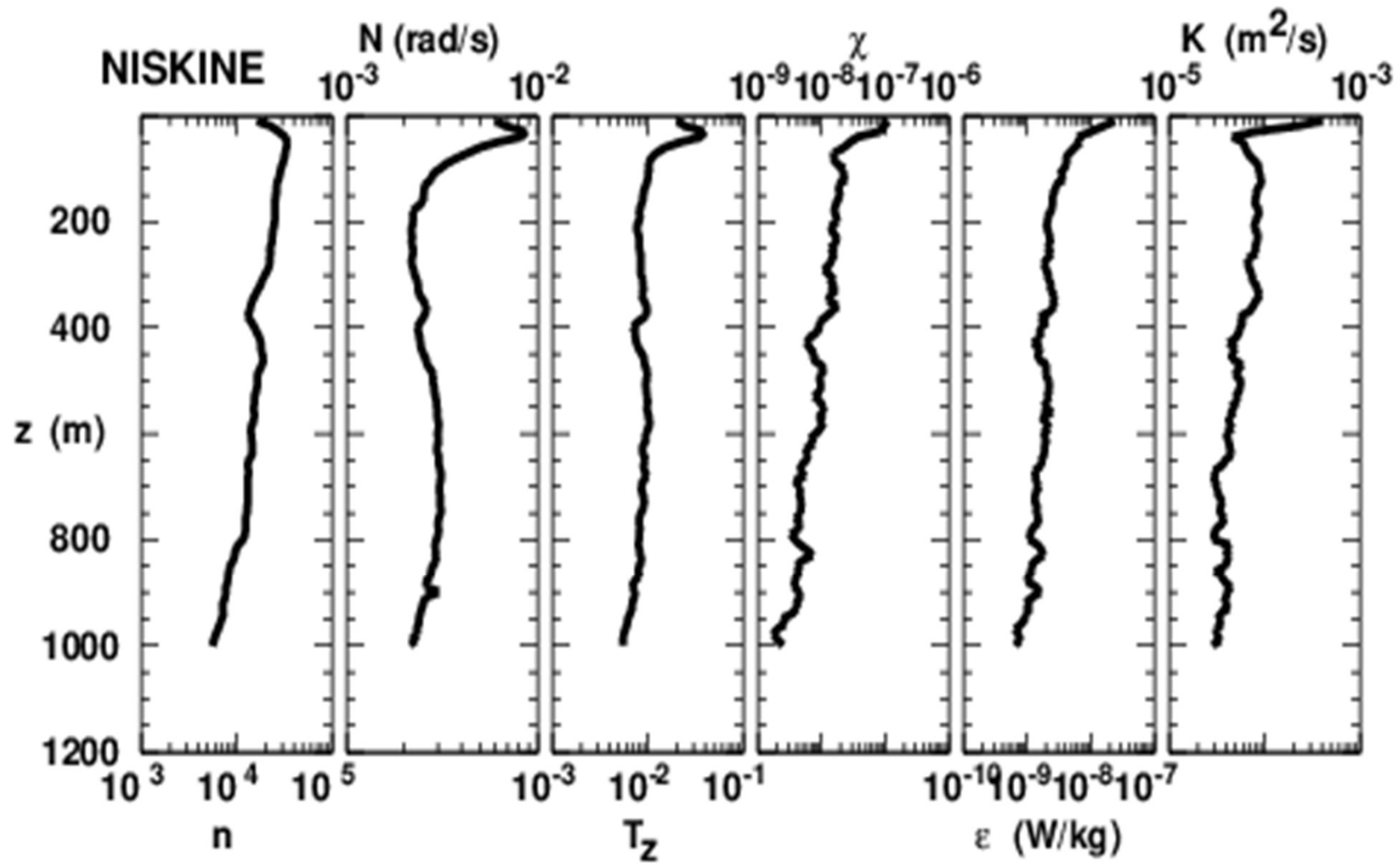
# EM7806 Time-Series



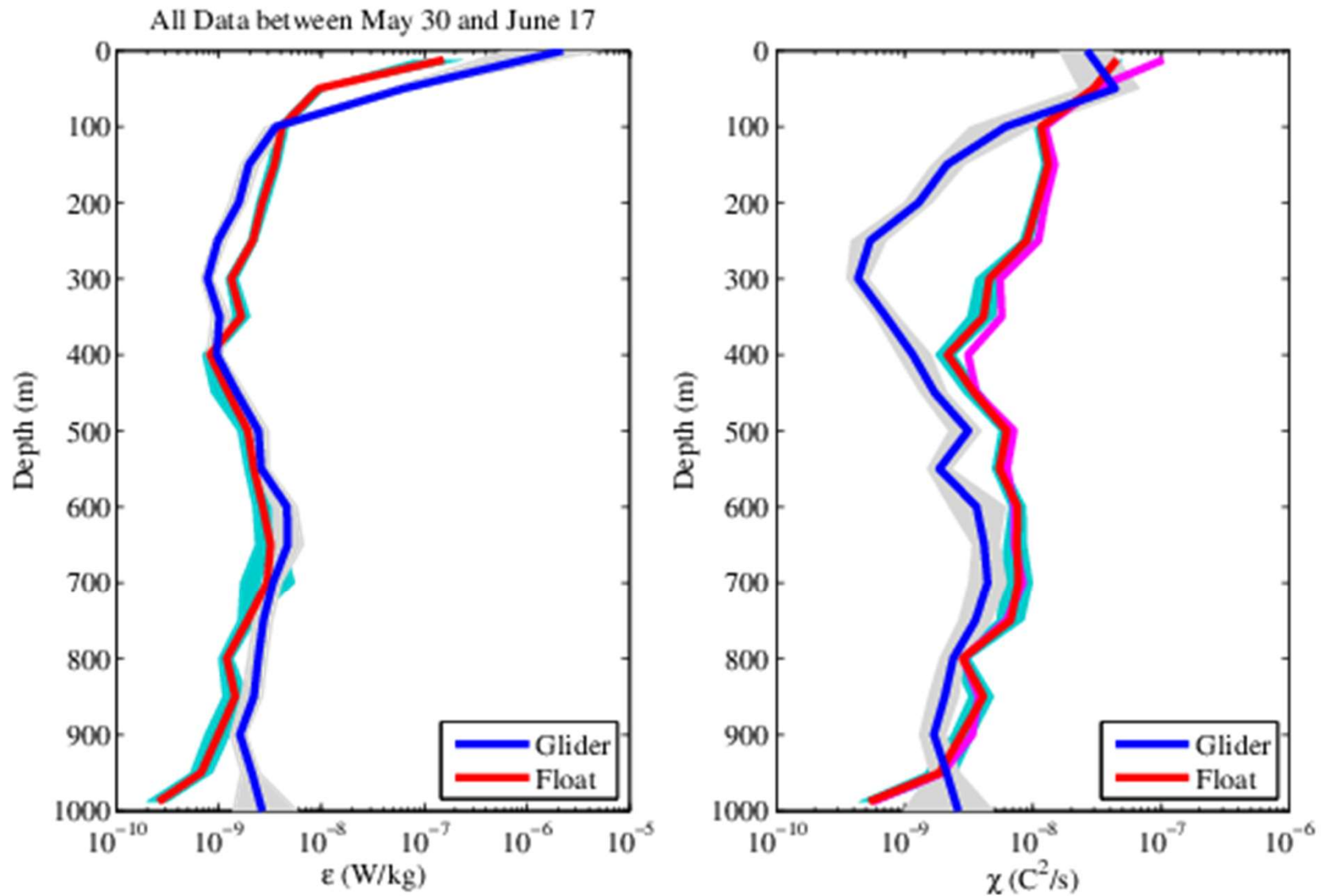
# Bulk Time-Series



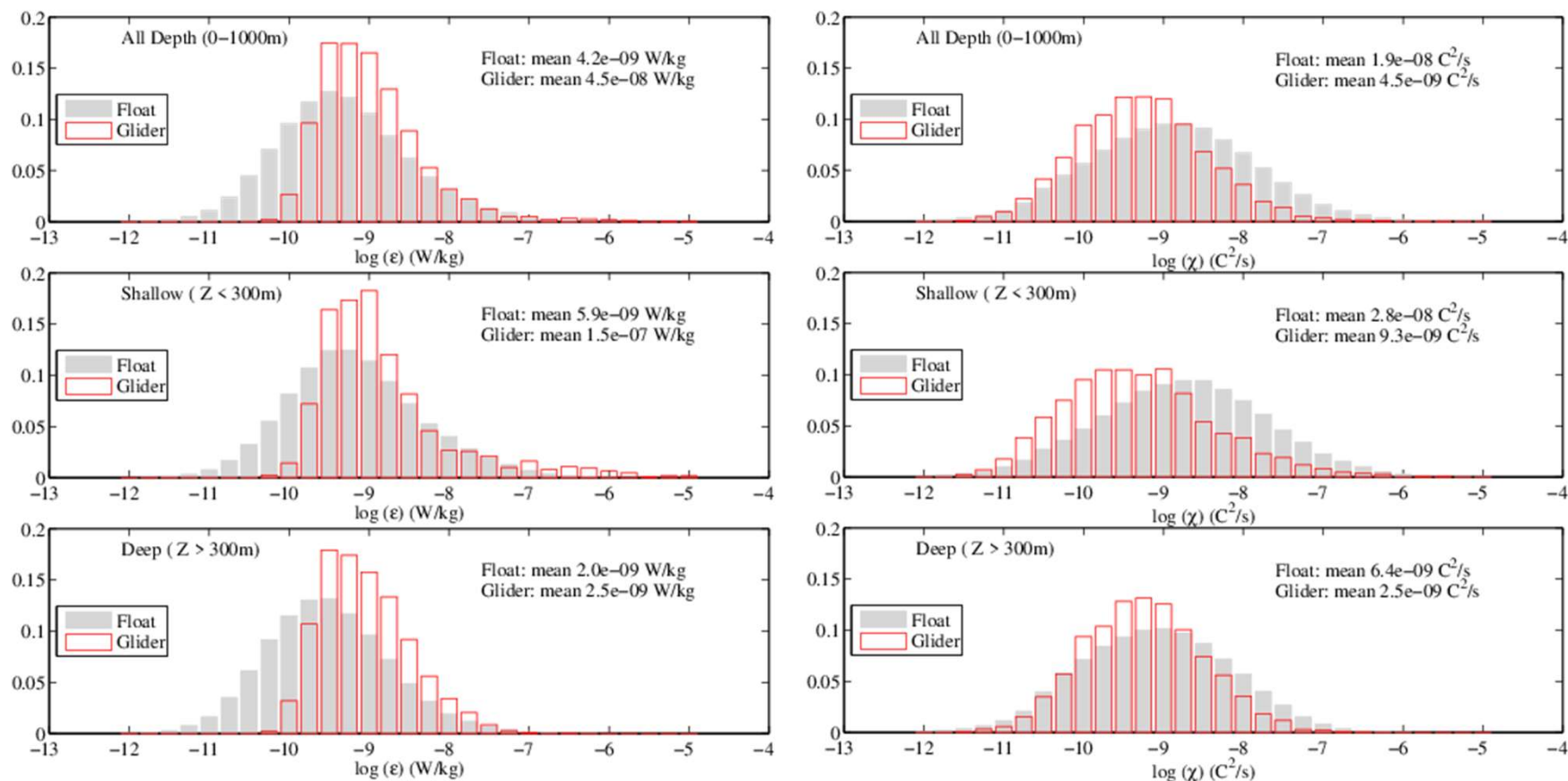
# Float-Average Profiles



# EM Float/Glider Comparison

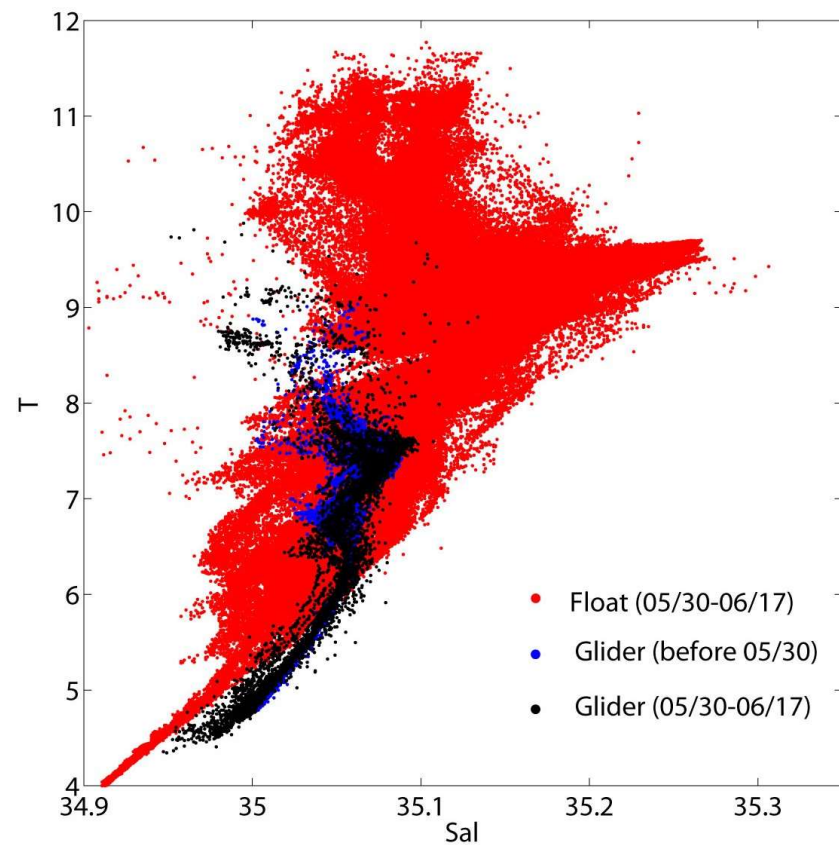
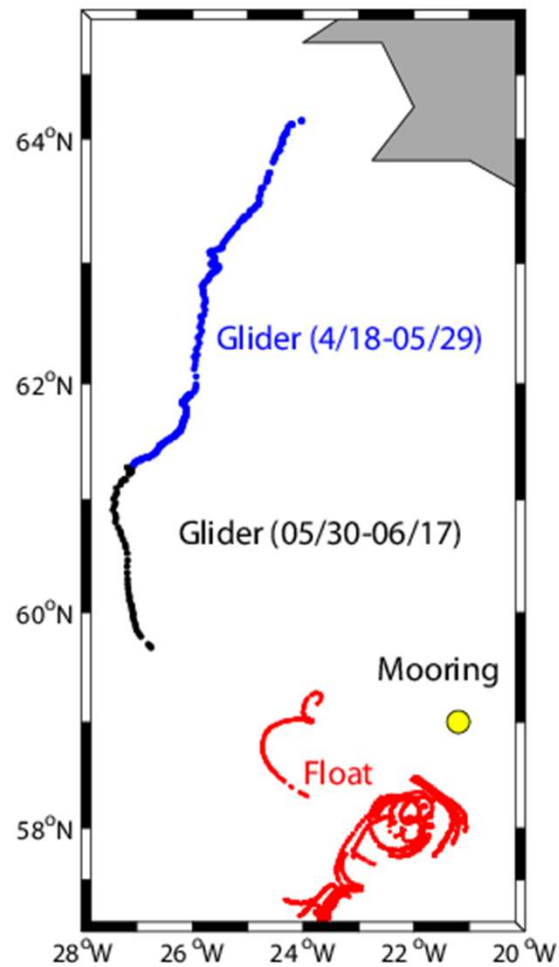


# EM/Glider PDF Comparisons





# Didn't Sample Same Water



# Summary

EM float measurements of temperature-variance dissipation rate  $\chi$  infer float-average TKE dissipation rates  $\varepsilon = (1.3-4.0) \times 10^{-9}$  W/kg and thermal diffusivities  $K_T = (0.3-0.8) \times 10^{-4}$  m<sup>2</sup>/s.

Preliminary comparison with glider data (courtesy Lou St. Laurent, Takashi Ijichi, Justin Shapiro) during process cruise (30 MAY-17 JUN) show similar profiles of TKE dissipation rate but different  $\chi$  in the remnant winter mixed-layer shallower than 300 m. The instruments did not sample same water nor in the same way (depth vs. glide).

More complete EM float data report available on request.





# PDFs

