# Techniques for Comparing AXBT and MODAS Generated Dynamic Height Fields

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## ABSTRACT

AXBT surveys in the Gulf of Mexico (GOM) provide relatively rapid and large scale characterization of the temperature structure of the water column. One product of these surveys is the dynamic height field. It is desirable to compute dynamic heights relative to a deep level of no motion (1500 m) for the GOM. Thus, the AXBT profiles of temperature must be edited to eliminate noise and errors characteristic of the AXBT system, and then be extended in a reasonable way to 1500 m depth. In addition, a suitable salinity profile must be developed as well, in order to calculate dynamic height for each AXBT profile. MODAS (Modular Ocean Data Assimilation System) is used by the US Navy to produce three-dimensional fields of temperature and salinity. We have used the MODAS climatology to extend AXBT temperature profiles and to develop salinity profiles for three AXBT surveys in the GOM (May, 1998; Jan. and May, 2000). We demonstrate the technique we have developed for this use and compare results from it to MODAS fields, in order to evaluate the quality of each system and determine future needs for remote and in-situ data acquisition.


## CONCLUSIONS

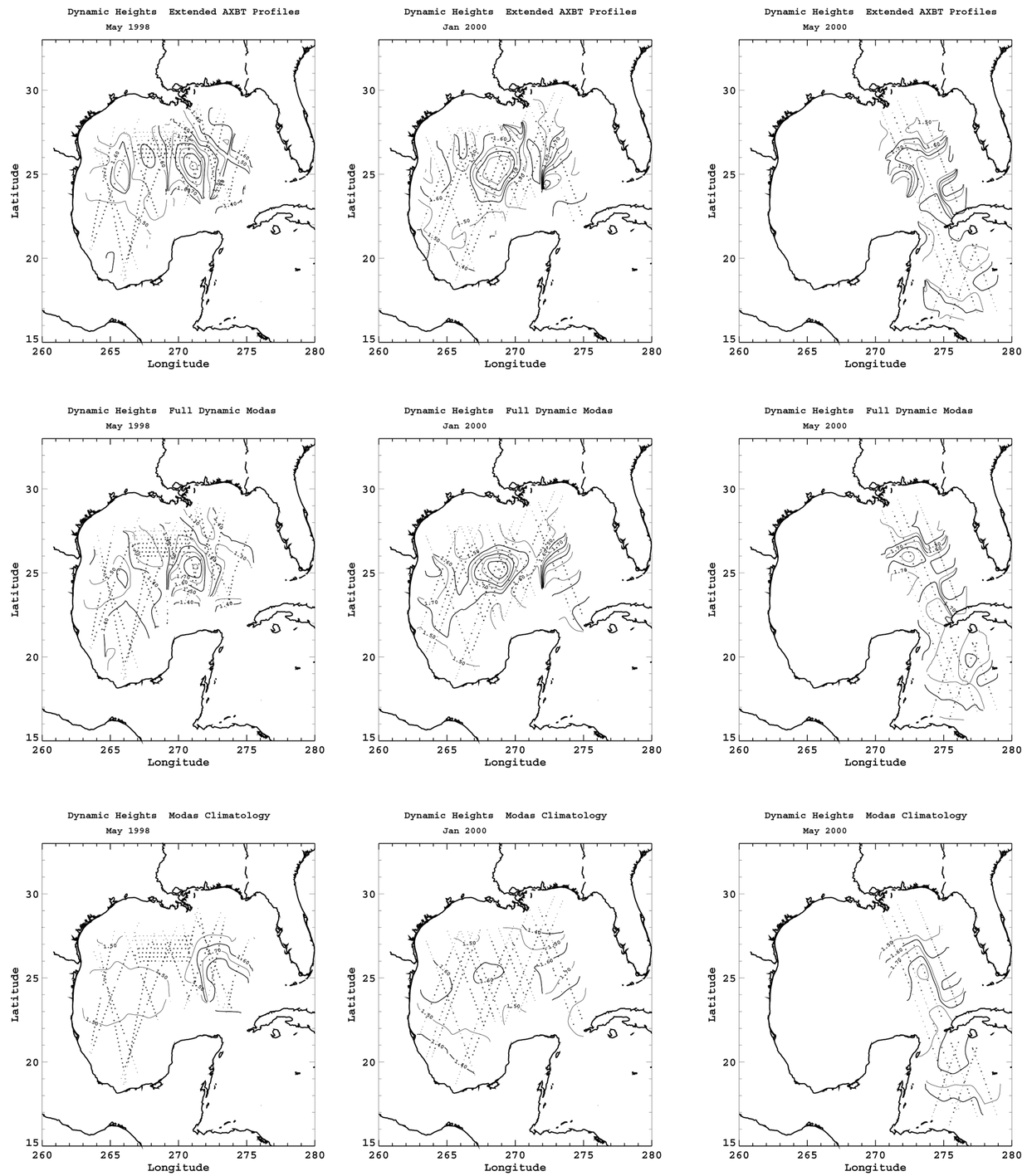
AXBT profiles are edited and extended to 1500 m using MODAS climatology.

Dynamic heights are estimated from the extended profiles. These differ from dynamic heights of deep CTDs by 2-5 dynamic cm.

Dynamic heights are also calculated from Dynamic MODAS profiles.

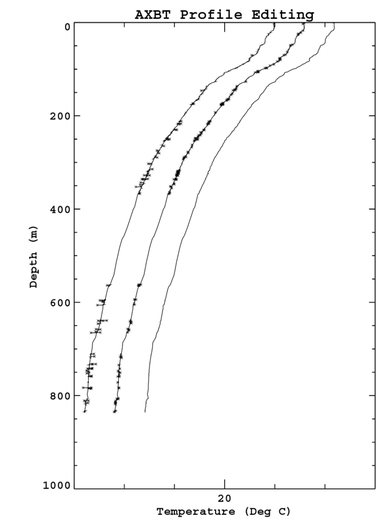
Dynamic height fields from AXBTs and Dynamic MODAS show very similar features not shown by MODAS climatology.

There are differences in absolute dynamic height between AXBT and Dynamic MODAS profiles. These differences are due to temperature differences between the profiles.

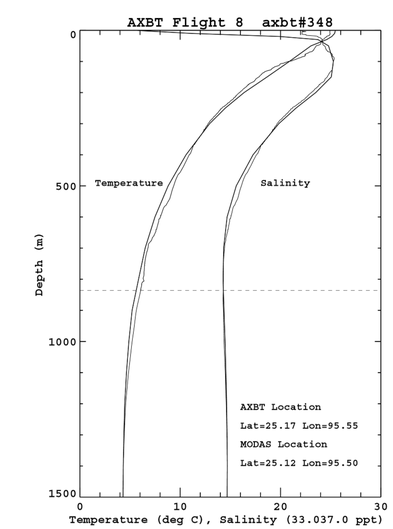



DYNAMIC HEIGHT FIELDS FOR MAY, 1998. DYNAMIC HEIGHT FIELDS FOR JAN, 2000. DYNAMIC HEIGHT FIELDS FOR MAY, 2000.

Top: AXBT profiles, Middle: Dynamic MODAS profiles, Bottom: MODAS climatology profiles. Small symbols indicate AXBT profiles either less than 400 m deep or water depth less than 1500 m.




PROFILE EDITING: Raw profile(left), and successively edited profiles. Bad points eliminated automatically are indicated by asterisks. The final profile is spline fitted onto a 1 m depth grid.




AN EXTENDED AXBT PROFILE: The AXBT temperature profile is extended using MODAS climatology. The salinity profile is generated using the MODAS TS relation. Heavy lines are the corresponding MODAS profiles. Extension is only done for AXBT profiles deeper than 400 m.