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13. Abstract *(Maximum 200 words).*

This report documents improvements in the operational, global-scale Optimum Thermal Interpolation System (OTIS) at the Fleet Numerical Oceanography Center (FNOC) due to upgrades in the system from 1988 to 1990. OTIS is an optimal estimation-based, thermal analysis system which combines ocean temperature climatology with real-time surface and sub-surface temperature observations. This system is coupled to both the Thermodynamic Ocean Prediction System (TOPS) and the Naval Operational Global Atmospheric Prediction Systems (NOGAPS) which together provide additional information in data sparse areas.

Modifications or upgrades to OTIS, TOPS, and/or NOGAPS may thus affect the performance of OTIS. To monitor the impact of these changes on OTIS, FNOC uses unincorporated bathythermograph, satellite-derived, multi-channel sea surface temperature and surface ship sea surface temperature data from the operational run-stream. These are compared, in real-time, with OTIS data extracted for the same time and location over specified regions. Data for a given region are accumulated over 30-60 day periods to allow statistical comparisons.

Upgrades to OTIS, TOPS, and NOGAPS took place between 1988 and 1990. The combined result of these upgrades was a qualitative improvement in both surface and subsurface OTIS maps. This qualitative result is supported by three month (Feb-Apr) statistical composites. These show O(20%) improvement in RMS temperature errors for 1990 over 1988, primarily in the western Atlantic and Pacific.

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