Dear Dr. Spinrad:

In order to complete my ONR grant entitled "CTZ Jet Structure," I am sending three copies of the Final Technical Report to you with copies distributed as indicated below.

Sincerely,

Douglas R. Caldwell
James N. Mourn

cc: Defense Technical Information Center (2 copies)
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Alexandria, VA 22304-6145

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The task under this grant was the analysis of oceanic microstructure and other data obtained in two cruises carried out as part of the Coastal Transition Zone experiment. As a result of this analysis, three scientific papers have been published and one more has been submitted for publication.

Summaries of the major results contained in the publications follow:

1. "Sea slicks and surface strain" by J. N. Mourn, D. J. Carlson and T. J. Cowles, Deep-Sea Res., 37, 767-775, 1990: For the first time, detailed underway measurement of sea-surface chemistry were made in conjunction with microscale physical measurements. Intense sea-surface slicks were discovered to be associated with convergence-favorable surface strain, low wind speeds and low mixing rates, within a meandering filament of cool water. No intense slicks were found in regions of divergence-favorable surface strain, or at higher wind speeds, or outside the cool filament. Slicks were observed only in regions of high subsurface chlorophyll fluorescence.


3. "Structure and Dynamics of a coastal filament" by R. K. Dewey, J. N. Mourn, C. A. Paulson, D. R. Caldwell and S. D. Pierce. J. Geophys. Res. 96, 14,885-14,907. In this report on repeated transects across the filament using a microstructure instrument, a towed thermistor chain and an ADCP, it was shown that a) the flow was very nearly geostrophic, but on the occasion that the filament flowed southward, nongeostrophic influences were detected, b) vertical velocities are consistent with model predictions, and c) local recirculation within the filament is significant.

Another manuscript submitted for publication and presently under review is:

- "Microstructure Activity within a Mini-Filament in the Coastal Transition Zone" by R. K. Dewey, J. N. Mourn and D. R. Caldwell, submitted to the Journal of Physical Oceanography: The properties and possible origin of a small filament identified within the CTZ are studied using microstructure measurements, along with satellite observations and other shipboard measurements. It is concluded that the filament was created by a combination of diapycnal mixing driven by strong shears, and localized upwelling driven by adjustments in the velocity field.