minimum depth of the σ_{23} contour, which lay near the top of the thermocline, was especially useful for this purpose). The second transect (Transect 2) was perpendicular to the first. Again, contouring of the temperature and density data was used to better define the location of the center of the eddy in analogy to the procedure used for the east-west line. The best estimate of the center of the eddy was then determined to be at Station 13 or 19.67°N, 156.52°W, which is likely within a few km of the true geometric center of the eddy feature. This station was subsequently used for more intensive sampling (called the IN Station).

Transect 3 and 4 , running at 45° with respect to the east-west and north-south transects, were then conducted (Figure 3). The patterns ran from the northwest to the southeast and then from the northeast to the southwest. The star sampling pattern was then completed and data were contoured as transect sections with respect to depth and in plan view on depth and density horizons. Based on the four transects, it was concluded that the new sampling center was well within a few kilometers of the true geometric center of the eddy. It was anticipated that Cyclone Noah might move during the six days of our ship-based transect sampling. However, data collected during a subsequent visit to the final sampling center and available satellite images indicated that the eddy center had not moved by more than a few kilometers, a distance that is likely within the uncertainty of our estimated eddy center.

Although the initial surface expression (e.g., from satellite SST imagery) of Cyclone Noah was limited in scale to only about 40 km, analysis of ship transect-depth profiles (Figure 4) revealed a fully developed elliptical cyclonic feature (with its major axis being oriented northwest to southeast with a length of about 130-150 km based on the distance from the center of the eddy at which the σ_{23} isopycnal surface was nearly level) as evidenced by its size, its tangential speeds (~40-60 cm sec^{-1}; Figure 5), and outcropping of several physical and biological properties (Figure 4). More specifically, the 24^0C isotherm rises from about 125 m outside the eddy to about 65 m near the eddy's center, the 35 psu isohaline surface rises from about 125 m outside the eddy to about 50 m near the eddy's center (not shown), and the 24.8 sigma-t isopycnal surface rises from about 125 m outside to about 75 m at the eddy's center (not shown). Outcropping of isopleths of each of these variables is also evident within a rough distance of 10-30 km of the eddy's center.

A subsurface inner-core of high salinity water is centered at a depth of about 80 m in the region of the eddy's center. A central chlorophyll *a* maximum peak (concentrations greater than 0.5 mg m^{-3}) is seen near the eddy's center, which is located at a depth of roughly 75 m. The chlorophyll *a* maximum layer deepens away from the center of the eddy and chlorophyll *a* concentration decreases radially. The chlorophyll *a* maximum layer was loosely bounded by isopycnal surfaces of 24 to 23.5 kg/m^3, and there was a good correspondence between chlorophyll *a* and particulate maxima (not shown here). The inner-core region of extremely high biomass, productivity, and particle flux was apparently less than 15 km in diameter. The 1% light level depth is also indicated in the chlorophyll *a* panel of Figure 4. The uplifting of nutrients into the euphotic layer and the elevated chlorophyll *a* levels toward the center of the eddy are consistent with increased nutrient stimulated productivity within cold-core eddies. The overall extent of the eddy shows strong anomalies reflected in lower temperature, higher salinity, greater density, higher nitrate + nitirite concentrations, and higher chlorophyll *a* concentrations (Kuwahara et al., this volume, Rii et al., this volume).