

Florida Current Profile at Miami Central Outfall

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This project was sponsored as part of a broader one designated SEFLOE (South-east Florida Outfall Experiment) and conducted through the NOAA/AOML office. The focus of this study was to collect current and ctd data (conductivity, temperature, and pressure) at the Miami central sewage outfall, three miles east of Virginia Key. The waste treatment plant located on this Key pumps its slurry through the pipeline and distributes it from a diffuser about 20 meters underwater.

Three deployments were made from (1) July 1992 - August 1992, (2) August 1992 - Sept 1992, (3) February 1993 - May 1993. An ADCP (Acoustic Doppler Current Profiler) and moored ctd were placed near the diffuser at the bottom depth of twenty-five meters. Current speeds and directions were then sampled every meter and averaged every ten minutes for periods one and two, and every fifteen minutes for period three. CTD data were collected at a bottom depth every ten minutes for period one and every fifteen minutes for period three.

The average current speed was nearly one hundred cm/sec, two knots, in a direction of true north. Most of the time its direction was northward between one-half and one and one-half knots. This is described as the Florida Current, part of the Gulf Stream system. Occasionally, the current reverses and flows southward. The tidal range is, at most, one meter.

The nearshore water quality is influenced by the outfall dispersal. Legislation mandates that concentration limits be acceptable. The dilution of effluents depends on the pumping rate and the current strength. Ideally, a current meter could feed back the data in real-time to the pumping station and discretely regulate the flow rate of sewage to take advantage of strong currents or reduce the impact of concentrating sewage on site or in the shoreward direction. An integrated system is feasible to balance the needs of man and the environment.