



## PHYSICAL OCEANOGRAPHIC SERVICES

**TEG Oceanographic Services**, founded in 1988, is a California based small business enterprise (SBE) providing specialized marine scientific services to industry, government agencies, environmental and engineering firms.

**TEG Oceanographic Services** offers its clients technical expertise and an extensive inventory of marine data gathering equipment and instrumentation. Our scientists have worked throughout the world, developing new technologies and innovative methods to provide solutions to complex oceanographic problems. TEG also designs and fabricates custom mooring systems to meet your specific project requirements. Our field equipment inventory includes survey vessels, precision positioning systems, and a variety of hydrographic and physical oceanographic instrumentation and hardware.

### LIST OF OCEANOGRAPHIC SERVICES

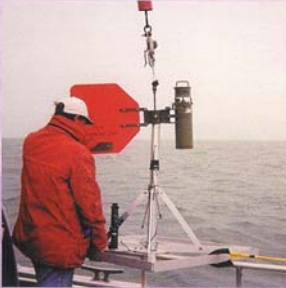
- Current measurements and analysis (doppler and vector averaging instrumentation)
- Wave/tide measurements and analysis
- Bathymetric and subbottom surveys
- Numerical circulation modeling
- Meteorological data collection
- CTD surveys and instrumentation
- Standard and custom data packages
- Specialized equipment design and fabrication
- Dye studies and plume modeling



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## REPRESENTATIVE PROJECT EXPERIENCE



### Current and Ice Movement Study in the Beaufort Sea, Alaska.

TEG deployed Aanderaa current meters on three separate moorings in 45-feet of water, four miles NW of Prudhoe Bay, in support of a pipeline corridor study for the transport of oil from offshore gravel islands through the

ice gouge zone to processing facilities ashore.

### Circulation Model of the Hylebos Waterway, Commencement Bay, Washington.

TEG personnel developed a two-layer analytical circulation model of the Hylebos Waterway, Tacoma, Washington. Tidal measurements, conductivity/temperature/depth profiles and a combination of boat-mounted acoustic doppler and moored current meter data were used to calibrate the model.



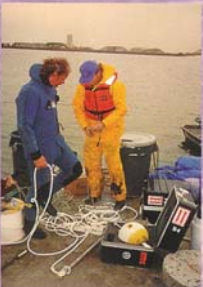
### Oceanographic Studies to Support NPDES Permitting and Compliance of the Discharge from the Alyeska Pipeline Service Company's Ballast Water Treatment Facility at Valdez, AK.

TEG personnel managed the complex field program which included: dye tracing of the plume, current metering, tide measurements, computer modeling and real-time observations of diffuser performance using a remotely operated vehicle (ROV).



### Geotechnical Investigation, Voice of America Relay Station, Sao Tome Island, West Africa.

TEG investigated rights-of-way for a submerged fuel transfer pipeline. Divers surveyed possible routes for optimal bottom conditions for pipeline anchor placement. A 6 hp. vibrocore system obtained five-meter long core samples at specific intervals along established survey track lines for geotechnical analysis.



### Current and Wave Study at Point Mugu Naval Air Weapons Station, Point Mugu, CA.

TEG deployed four InterOcean™ S4 current meter moorings and a DataWell™ Wave-rider telemetering buoy in Mugu Lagoon for a four month period to study lagoon circulation patterns and flushing rates. The study was funded by the US Navy to estimate leachate impacts from a historical land fill on lagoon water quality.

### Outfall Siting Studies for Echo Bay Mines, Southeastern Alaska.

TEG mapped the nearshore circulation patterns at proposed outfall locations for the A-J Mine in Juneau and for the Kensington Prospect on Lynn Canal using a 150 kHz acoustic doppler current profiler. In the latter instance, the suspected presence of a nearshore gyre was of major concern to local salmon fishermen. TEG identified and charted the gyre on both the flood and ebb tides. The outfall diffuser, once constructed, would be located outside of the gyre effects to ensure no shoreward return of the plume. CTD profiles, bathymetry and tide heights were also measured.



### Circulation Study for the Port of Oakland, CA.

TEG performed oceanographic studies to develop a circulation model for the Port of Oakland. The project included the deployment of InterOcean™ S4 current meter moorings, the collection

of burst wave height measurements of vessel wakes, and doppler (ADCP) current and CTD profiles of the main channels.



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**A leader in marine consulting & data acquisition**