



Coastal and
Marine Services



Coastal engineering to help communities manage risk and improve resiliency

We have proven experience in providing our clients with coastal engineering, environmental, and permitting services for coastal infrastructure and ecological restoration projects. The ability to innovate and design within permitted projects areas, while also being sure to attain timely regulatory approvals, is an essential piece to the completion of projects, and one in which we have demonstrated significant ability through a wide range of projects.

Our team provides complete services to clients, including project and program management, field studies, site evaluations, technical and policy reviews, regulatory assessments, development of proposals and plans, design, permitting, monitoring, compliance audits, expert witness testimony, and technical training. Staff specialty groups work with Stantec's regional offices close to the project to provide a thorough and coordinated approach. Throughout our history, Stantec's staff has supported private, local, and federal clients with coastal, multidisciplinary planning, environmental engineering, and construction support services for all types of public programs and projects.

Coastal Engineering services include:

- Beach Nourishment Design
- Dune Restoration
- Coastal Structures
- Local and Statewide Beach Management Plans
- Post-storm Damage Assessments and Recovery
- Inlet Management Planning and Sediment Budget Development
- Coastal Engineering Analysis
- Sand Sourcing (Offshore and Upland)
- Program Management Support - Program Planning, Contracting, Budgeting, and Cost Control
- Environmental Analysis, Mitigation, and Permitting
- Coastal Economic Evaluations and Funding Program development
- Coastal Development and Vulnerability Analysis
- Construction Administration, Bidding, Inspection and Permit Compliance Monitoring of Beach Nourishment and Marine Dredging Projects
- Dredge Design and Disposal Options
- Environmental Impact Assessments and ERP/JCP Permitting
- Sediment Transport, Sediment Budget Analysis, Accretion Modeling
- Inlet Improvement and Sand Bypassing
- Restoration and Management Plans for Coastal Lagoons and Beaches
- Shoreline Erosion Assessment and Management
- Numerical Modeling of Wave Diffraction, Refraction and Shoaling
- Circulation and Water Quality Modeling
- Coastal Hazard Mapping and Flood Management Studies



24,300

cubic feet/second

Total pumping capacity
of 24,300 cfs reducing
risk for New Orleans
communities

Our **designs** rise with the tide

The concept of Sea Level Rise has advanced far beyond an academic concept. Regardless of the perceived causal relationship between atmospheric and/or cyclic changes in ocean elevations, current documented evidence exists that this phenomenon is a significant risk to the people, infrastructure, economies, and critical habitats in coastal zones worldwide.

There are many ways to identify potentially impacted communities in the United States, however, based upon population analysis and statistics from FEMA, it is reasonable to estimate that between 35% and 40% of the US population live within communities likely to be impacted by changes in Sea Level and coastal processes. Sea level Rise not only results in the obvious encroachment on community infrastructure, it also exacerbates the impacts of storm events and changes the elevation and quality of groundwater (drinking water). It also significantly impacts agriculture, power & fuel supplies, fisheries, and critical coastal habitats.

Stantec engineers, scientists, and planners are actively working with communities worldwide to anticipate the current and future impacts of changing sea levels. We live and work in the communities and environments impacted by Sea Level Rise. This is personal for us, and our ability to develop actionable and proactive strategies to prepare

for, and sustain critical resources and infrastructure is demonstrated in the solutions we deliver every day to our coastal community partners.

Sea Level Rise services include:

- Projected Sea Level Inundation Mapping
- Future Storm Surge Inundation Modeling
- Vulnerability and Resiliency Assessment
- Criticality Assessment and Prioritization
- Risk and Uncertainty-based Engineering Design
- Infrastructure and Facility Adaptation and Mitigation Planning and Engineering
- Cost Benefit Alternatives Analysis
- Ecosystem Response Modeling

↓ Prime Hook Marsh Restoration
and Shoreline Resiliency
Milton, DE





Protecting our coastal ecology

Coastal ecosystems are found throughout the world where oceans and inland waters meet the land surface. The type of waters and terrestrial environments that occur in a coastal ecosystem vary extensively from marine to fresh or even mixed brackish environments. Although coastal ecosystems as a whole exhibit some shared characteristics, each has its own unique physical and biological elements.

They are places with some of the highest species diversity on the planet, and where our human populations and communities drape across an extensive mosaic of environments. Our coastal communities and infrastructure are influenced by, and result in influences on, our coastlines. Our Scientists and Engineers consistently demonstrate an actionable understanding of how natural systems and infrastructure interact. This expertise and experience is the foundation of Stantec's ability to assess and develop harmonious, sustainable and resilient solutions to integrated challenges in coastal zones.

State and Federal Regulatory protection of coastal systems such as the Clean Water Act, the Coastal Zone Conservation Act, the Marine Mammal Protection Act, and the Endangered Species Act are all leveraged to assist in providing guidance for appropriate interactions between natural and built environments. Stantec engages closely and corroboratively with our regulatory agency project partners to develop compliant and appropriate approaches, which meet the expectations of our clients while maintaining the integrity of critical coastal ecology.

Coastal Ecology services include:

- Ecosystem Restoration
- Coastal Restoration
- Stream Restoration
- Wetland Habitat and Marine Assessments
- Environmental Assessments
- Regulatory Permitting and Compliance
- Clean Water Act Section 404/401 and State Permitting
- Cultural Resources
- National Resource Damage Assessments (NRDA)
- Endangered Species Surveys



Designing plans that restore natural processes requires experience. Success in a coastal environment requires knowledge and training in marine habitats, an understanding of biological, physical, and chemical processes, and the application of relevant regulations.



Perico Preserve
Bradenton, FL





Marine science solutions to sustain oceanic environments

Our oceans consist of 97% of the world's water, covering over three quarters of the planet. With an estimated half of the world population living within coastal zones, many of these communities rely on the \$500+ Billion dollar economy that's attributed to ocean-based business. The biological, physical and economic influence of the world's oceans cannot be overstated. To be effective as a provider of coastal solutions, it is critical that we also deliver expertise in the Marine Sciences. Whether as required for permitting, or from a final deliverable perspective, a proven understanding of the relationship between coastal processes and Marine Sciences is a necessity.

Marine scientific-consulting is a complex and interdisciplinary offering that Stantec has invested many years of effort in perfecting. It requires expertise in many technical and regulatory areas. As our practice has evolved, we have developed into of the most capable interdisciplinary teams working in the industry. We don't only rely on our in-house expertise and resources, we have also developed an enviable stable of regional, academic, and specialty relationships with clients, regulatory agencies, and professional partners that allow us to assemble the most capable and experienced experts to tackle any challenges a project might present.

We understand that throughout the world, each marine environment is different. Our marine specialists have explored and developed solutions from the deeper oceans to near-shore environments. Defining and developing a better understanding of marine habitats from the Gulf and Caribbean to the Arctic oceans is something at which we excel. We have repeatedly proven our ability to clearly understand the needs and challenges of coastal communities, commercial entities, and government agency clients. We strive each day to deliver results that meet and exceed their expectations.

Marine Science services include:

- Consultation and Engagement
- Regulatory Permitting
- Environmental Assessments
- Ecology Risk Assessment
- Resource Assessment and Baseline Data Collection
- Habitat Planning, Restoration, and Enhancement
- Site Monitoring
- Research and Development

Port operations and economics, transformed

At Stantec we understand that the successful realization of projects for Ports and Marine Terminals requires a multi-disciplinary approach. With more than 60 years of experience across North America in design and engineering, our teams combine specialized, worldwide knowledge experience and expertise with local project delivery.

As a proven total-solutions partner, Stantec provides a wide range of professional and multi-disciplinary consulting services in the field of Ports and Marine Terminals. Our core strength lies in the integration of the key skills required for master planning, feasibility studies, engineering design, specialized geotechnical, project management, environmental services and construction supervision for ports and marine projects.

From enhancing port profitability to integrating port activities with innovative information systems, we are focused on economical, bottom-line solutions.

With a global presence, Stantec serves a wide spectrum of public and private clients, including government agencies, marine transportation entities, owners, operators, and tenants of Port and Marine Terminals. Because our client's success is our success, we always do what is right for their projects and their company.

Port and Marine Terminals services include:

- Port Master Planning
- Project Management
- Planning and Feasibility Studies
- Multidisciplinary Architecture and Engineering
- Marine Structures Engineering
- Site Services and Utilities
- Power Supply, Distribution and Lighting
- Civil Infrastructure (Roads/Bridges/Rail)
- Geotechnical Engineering
- Hydraulic Engineering
- Environmental Engineering Permitting
- Contaminated Sites/Site Restoration
- Design for Envision (Sustainability)
- Infrastructure Resiliency Design
- Geomatics and Bathymetry
- Ocean and Coastal Engineering
- Port Security and Threat Assessment

Dredging and shoreline solutions

Beaches and other critical coastal infrastructure are an essential economic driver and recreational resource. Our experienced design and permitting professionals have delivered successful coastal inlet and port dredging, beach nourishment, and environmental permitting projects throughout the Gulf region.

We are sensitive to the reality that these types of recovery and protection projects can result in temporary disturbances to coastal communities, industry, and tourism. We engage the public and other potentially impacted entities early in the project life cycle. Our ability to clarify and diffuse any misconceptions or concerns about the activities associated with dredging, the placement of beach fill material or other coastal construction activities has proven invaluable to our clients. Stantec's approach is a differentiator resulting in cost efficiencies and the timely completion of construction. Awareness that any potential short term disruption will ultimately result in improved recreational, economically beneficial and resilient coastline builds strong community support for our clients and the ultimate success of their projects.

Dredging and Shoreline services include:

- Beach Nourishment Design
- Sand Sourcing (Offshore and Upland)
- Dredge Design and Disposal Options
- Environmental Impact Assessments and State/Federal Permitting
- Sediment Transport, Sediment Budget Analysis, Accretion Modeling
- Inlet Improvement and Sand Bypassing
- Coastal Levees and Revetments
- Restoration and Management Plans for Coastal Lagoons and Beaches
- Shoreline Erosion Assessment and Management
- Numerical Modeling of Wave Diffraction, Refraction and Shoaling
- Circulation and Water Quality Modeling
- Coastal Hazard Mapping and Flood Management Studies





Preserving our coastal water resources

Coastal science, engineering design and permitting, and ecology are disciplines we truly understand, and as a result, we are able to develop designs that are self-sustaining and work with natural processes. We are leaders in the field of coastal restoration, constantly setting the bar for continued technical innovations and ecological sensitivity. Our coastal restoration professionals are passionate about their careers and include engineers, soil scientists, regulatory experts, aquatic toxicologists, botanists, and hydrologists. Our multi-disciplinary team will consistently deliver a complete understanding of interdependencies and ultimate performance metrics, blended with a clear understanding of your needs, throughout the project lifecycle.

Coastal Water Resources services include:

- Ecosystem Restoration
- Coastal Restoration
- Stream Restoration
- Wetland Restoration
- Environmental Assessments
- Regulatory Permitting and Compliance
- Clean Water Act Section 404/401 and State Permitting
- Cultural Resources
- Wetland Assessments
- Endangered Species Surveys

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Design with community in mind