

PORTS 2010

*Building on the Past,
Respecting the Future*

PROCEEDINGS OF THE TWELFTH TRIANNUAL
INTERNATIONAL CONFERENCE

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PIANC

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Preface

The **Ports** conferences originated in 1977 as a means of sharing technological advances related to the development of port and harbor facilities. These conferences, held triennially, have been the premier venue for the free exchange of the experiences of maritime professionals, and have allowed wide-ranging cross-pollination across the incredibly diverse range of expertise engaged in modern port development. This year's **Ports** conference theme, "Building on the Past, Respecting the Future", reflects the growing need to intelligently and sustainably develop port facilities in mature social settings, while using our best abilities to develop efficient and effective facilities that will serve our needs for decades to come.

Ports 2010 is sponsored and organized by the Ports and Harbors Committee of the Coasts, Oceans, Ports, and Harbors Institute of the American Society of Civil Engineers, and co-sponsored by PIANC. The Ports and Harbors Committee focuses the talents of a diverse group of design professionals on proactive improvement of port, waterway, and facility engineering, development, and operating techniques, practices, and standards. Most of the Committee was actively and directly engaged in the development of the **Ports 2010** program and organization of the conference. The Conference efforts were led by:

Stephen Dickenson, P.E., Conference Chairman
Thomas Ward, P.E., S.E., Technical Committee Chairman
Bruce Ostbo, P.E., S.E., Technical Committee Co-Chair
Michael Adams, P.E., P&H Committee Chairman

306 abstracts were submitted for consideration by the Conference Technical Committee, consisting of 36 individuals drawn from across the port design and development community. The Technical Committee chose 142 for publication in these Proceedings and presentation at the Conference. These papers reflected our industry's full diversity, and were organized into 36 technical sessions covering:

Environmental Protection: Innovative Port Programs, Habitat & Wildlife,
Coping with Contaminants
Port Planning & Operations: Facility Maintenance & Management, Master
Planning & Inland Links, Master Planning
Terminal Planning & Design, Container Terminals: Automated, U.S.,
Foreign
Terminal Planning & Design: Energy & RO/RO Terminals, Small Craft &
Recreation, Military & Cruise
Navigation & Waterways: Widening & Deepening, Beneficial Reuse,
Modeling & Simulation, Sediment Management

Engineering Analysis, Structural: Seismic, Durability, Military Facilities,
Piers, Docks, and Wharves
Engineering Analysis, Coastal & Extreme: Seismic, Coastal / Waves,
Breakwaters, Harbors
Engineering Analysis: Dredge Materials, Navigation Works, Geotechnical,
What Lies Beneath
Port Infrastructure: Power, Corrosion, Pavement, Foundations
Equipment & Systems: Automation and New Technology, Novel Approaches,
Development Technique
Project Development: Finance and Information

The success of this Conference, as with all **Ports** Conferences, has relied on the contributions of the authors who submitted their work for our consideration. The preparation of **Ports** conference papers is a demanding process, and our heartfelt thanks go out to all of those who have participated in this far-flung community of professionals.

The Technical Committee was responsible for reviewing and selecting Abstracts, reviewing and vetting submitted Papers, ensuring compliance with the Conference's publication rules, reviewing Presentations, and acting as Session Chairs at the Conference. Their contributions, their good humor, and the support of their organizations are deeply appreciated:

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