

world harbour project

Building resilient urban ports and harbours through globally integrated research and management

The World Harbour Project

Initiated by the Sydney Institute of Marine Science (SIMS), the World Harbour Project (WHP) aims to develop resilient urban harbours through a global network of collaborating researchers. The project brings together international research institutions and agencies concerned with the health of these heavily urbanised waterways and the increasing challenges they face.

Like Sydney, many of the world's great cities such as New York, Rio de Janeiro and Shanghai are located on the coast. These working harbours are part of the fundamental fabric of those communities. The relationship between the city residents, industries and the marine environment requires ongoing study and management. The WHP tackles issues surrounding the multiple uses of harbours through global collaborative projects and targeted workshops. The Project works to facilitate and link programs across major international harbours, with a proactive focus on investigating and restoring ecosystem functioning and the consequent development of management best-practices that can be applied by all partner cities.



Understanding the socio-economic aspects of harbour development, environmental degradation and ecosystem restoration are important components of the WHP, as does educational outreach and dialogue and collaboration with industry and governments. To date the project has 26 institutional partners and 5 project specific partners, with more partners on the horizon.

Partner Cities and Project Partners

Abu Dhabi Auckland Boston Bremerhaven Chesapeake Bay Coquimbo Darwin Dublin Galway Heraklion Hobart Hong Kong Jakarta New York Penang Plymouth Port Elizabeth Qingdao Ravenna Rio De Janeiro Santander Bay Shanghai Singapore St Georges Bay Sydney Taipei Taiwan Tel Aviv Vigo Xiamen



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Project working groups (WGs)



WG1 - WATER & SEDIMENT QUALITY

As a result of residential and industrial development, harbour (sheltered bays and estuaries) waters and sediments often become enriched with nutrients and are subject to sedimentation and elevated loads of pollutants such as particulate matter, heavy metals, metalloids and organic contaminants. Water quality is also often compromised by physical modifications and built infrastructure within harbours due to changes in hydrodynamics. WG1 has three streams to explore these complex water and sediment quality issues:

- ***Contaminants and human health risk in harbour sediments***
- ***Hydrodynamics, water quality, and sediment transport issues in harbours***
- ***Identifying key microbial species and functional groups in harbour sediments and waters***



WG2 – GREEN ENGINEERING

The development of artificial structures (e.g. breakwaters pilings, and seawalls) in urban harbours can have widespread ecological consequences. As on land, attention is turning to green engineering techniques to restore natural communities, thereby enhancing fisheries production, oyster reefs and their associated ecosystems services to artificial structures within the coastal environment. WG2 currently has three streams to investigate different green engineering techniques:

- ***Investigating use of natural, man-made and eco-friendly materials on artificial structures***
- ***Testing new designs for artificial structures***
- ***Testing restoration of habitat forming organisms on artificial structures***



WG3 – MULTIPLE USES AND USERS

Harbours are associated with many activities and uses. Transportation and commercial activities are usually dominant, but harbours are also a focus for residential, recreational, traditional and spiritual activities. The varied requirements of stakeholders make it essential to understand and govern the multiple uses and users of these spaces. Current WG3 projects promote the integration of human and biophysical sciences and highlight the gaps between harbour users.

- ***Social science surveys***
- ***Environmental impacts of water pollution***
- ***Conflicts and the future in harbours***



WG4 – EDUCATION

The unusual nature of harbours — as a setting for high levels of human activity, such as shipping, industry, tourism, fishing and sometimes recreation can complicate management efforts. Worldwide there is a movement towards sustainable development of urbanised systems, both on land and in the ocean. WG4 strengthens links in urban coastal stewardship through the education by training young scientists and reaching out to harbour users, both public and private.

- ***Billion oyster project***
- ***STEP Sunburst environment program***
- ***Monthly educational webinars***