



Ministry of Sustainability
and the Environment
— SINGAPORE —



MEDIA RELEASE

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COASTAL PROTECTION STUDIES AT JURONG ISLAND AND NORTH-WEST COAST TO COMMENCE THIS YEAR

Singapore, 7 March 2022 – As the National Coastal Protection Agency, PUB has been making steady progress in charting coastal protection strategies to combat rising sea levels which are projected to increase by more than 1 metre by 2100 due to climate change. Following the commencement of the site-specific study for City-East Coast in 2021¹, studies at Jurong Island and the north-west coast will commence this year.

2 Singapore's coastline is highly varied and stretches over 300km. Coastal protection solutions will have to be developed based on the profiles of different segments of the coastline. Studies for the respective segments are conducted in phases, based on factors such as anticipated flood impact, criticality of assets within each segment and opportunities to dovetail with future development plans. This will also allow us flexibility to adapt our plans and be able to incorporate the latest developments in climate science.

New studies

3 JTC will lead the study for Jurong Island, while PUB will oversee the studies at the northwestern coast, starting with a 24km stretch from the Tuas Checkpoint to Lim Chu Kang jetty. This section consists mainly of dams and dykes that make up four coastal reservoirs (Murai, Poyan, Sarimbun and Tengeh), which are an important water supply source and will need to be protected from seawater intrusion. The study will look at ways to ensure the integrity of the

¹ Site specific study for City-East Coast commenced in May 2021

reservoirs' structures and further reinforce them against sea level rise. There are also some areas along this coastline that contain mangrove habitats – PUB will work with other government agencies such as National Parks Board (NParks) to explore the potential of implementing hybrid solutions that combine existing natural elements with hard engineering measures.

4 The second section of the north-west coastline to be studied covers a 15km stretch that includes Sungei Kadut and Lim Chu Kang, which will house the future Sungei Kadut Eco-District and Lim Chu Kang high-tech agri-food cluster. Key landmarks within this study that require protection are the Woodlands Checkpoint, Kranji Reservoir and Sungei Buloh Wetland Reserve, as well as several nature parks including Kranji Coastal Nature Park and the upcoming Lim Chu Kang Nature Park and Mandai Mangrove and Mudflat Nature Park. This will be a great opportunity for PUB – working with other government agencies and stakeholders – to reshape the coastline by creating new recreational spaces while conserving these nature landmarks, and to dovetail coastal protection measures with the upcoming developments. All three studies are expected to conclude by 2030.

5 To assess the twin threats of inland and coastal flood risks holistically, PUB is currently developing an advanced computational hydrodynamics model, known as the Coastal-Inland Flood Model². Both the model and the City-East Coast study are underway and will be completed by 2025.

6 Said Ms Hazel Khoo, Director of PUB's Coastal Protection Department: "As we embark on the next phase of our coastal protection work with the new studies, we will take a collaborative approach and look forward to hearing from the public and relevant stakeholders on solutions that would ensure our coastal spaces remain vibrant and liveable while effectively protected against rising sea levels."

Expansion of expert panel

7 In 2020, PUB established a Coastal Protection Expert Panel comprising international experts to serve as an independent advisory body and stay abreast of the latest international best practices and planning considerations. Professor Yong Kwet Yew, Professor of Civil and Environmental Engineering at the National University of Singapore, and formerly chairman of the Land Transport Authority's International Panel of Advisors, has been appointed as the new

² Development of the Coastal-Inland Flood Model commenced in April 2021

chairman of the panel. He will take over from Professor Chan Eng Soon, who has stepped down as chair to focus on his work at the Technology Centre for Offshore and Marine, Singapore (TCOMS). The panel has also been boosted by the addition of Dr Jane McKee Smith, Emeritus Senior Scientist with the US Army Engineer Research and Development Center and an expert in coastal and hydraulic processes.

8 On coastal protection work, Professor Yong said: “Addressing the threat of sea level rise in Singapore is challenging – there are many complexities involved and multiple planning considerations and trade-offs within our tight land constraints. Being able to tap on some of the best minds available in the fields of coastal engineering and climate change adaptation will be invaluable to help PUB with its coastal protection work. I look forward to working closely with my fellow esteemed panel members, building on the earlier good work under Professor Chan.”

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About PUB, Singapore's National Water Agency

PUB is a statutory board under the Ministry of Sustainability and the Environment (MSE). It is the national water agency, which manages Singapore's water supply, water catchment, and used water in an integrated way. From April 2020, PUB also took on the responsibility of protecting Singapore's coastline from sea-level rise as the national coastal protection agency.

PUB has ensured a diversified and sustainable supply of water for Singapore with the Four National Taps (local catchment water, imported water, NEWater, desalinated water). PUB leads and coordinates whole-of-government efforts to protect Singapore from the threat of rising seas and the holistic management of inland and coastal flood risks.

PUB calls on everyone to play a part in conserving water, in keeping our waterways clean, and in caring for Singapore's precious water resources. If we all do our little bit, there will be enough water for all our needs – for commerce and industry, for living, for life.

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Annex A: PUB's Coastal Protection Expert Panel members

1. Professor Yong Kwet Yew (*chair*)



Prof Yong is Professor of Civil & Environmental Engineering and formerly Senior Vice President (Campus Infrastructure) at the National University of Singapore (NUS). His expertise lies in the field of infrastructure development, and he has been involved in projects related to coastal reclamation in Singapore and Southeast Asia, including the Semakau Landfill project. He is also a member of the Ministry of Finance's Development Projects Advisory Panel, and was the scientific lead and co-chair for the Ministry of National Development National Research Foundation's Land & Liveability R&D Committee. He had previously chaired the Land Transport Authority's International Panel of Advisors.

2. Dr Jane McKee Smith (*new*)



Dr Smith is currently Emeritus Senior Scientist with the US Army Engineer Research and Development Center (ERDC). Her expertise lies in applied research on modelling of coastal and hydraulic processes, and hybrid solutions to attenuate wave energy. She is the co-developer of STWAVE, a wave model used in hundreds of civil and military projects. She was previously Senior Research Scientist for Hydrodynamic Phenomenon at the US Army Engineer R&D Centre and the Hydraulic Laboratory in Vicksburg, as well as Chair of the Coastal Engineering Research Council at the

American Society of Civil Engineers (ASCE).

Other Panel members

3. Emeritus Professor **Robert A. Dalrymple**, Civil Engineering in John Hopkins University, Professor of Engineering in Northwestern University
4. Emeritus Professor **Marcel Stive**, Coastal Engineering in Delft University of Technology
5. Professor **Robert Nicholls**, Director, Tyndall Centre for Climate Change Research, University of East Anglia
6. Professor **David Balmforth**, Visiting Professor, Water and Environmental Engineering, Imperial College London

Annex B: Infographic on scope of site-specific studies at Jurong Island and north-west coast



STEADY PROGRESS IN OUR COASTAL PROTECTION PLAN

3 new studies in 2022 to formulate solutions for our coastlines.

Rising sea levels is a global challenge to many coastal cities, and Singapore is not spared. We are taking timely action to protect our coastlines, and the opportunity to enhance our living and natural environment at coastal areas.

Site-specific studies at Jurong Island and the north-west coast will begin this year, following the commencement of the study for City-East Coast in 2021. These studies will formulate tailor-made coastal protection solutions for different segments of the coastline.

Scope of study:

Approximately 80km of coastline

AREA B1: NORTHWEST COAST (Coastal Reservoirs) Safeguarding our water resources

The four coastal reservoirs here need to be protected from seawater intrusion as they are important water supply sources.

AREA B2: NORTHWEST COAST

(Sungei Kadut, Lim Chu Kang)

Protecting our coast while conserving our ecosystems

In addition to Kranji Reservoir, this coastal area also houses several nature landmarks like the Sungei Buloh Wetland Reserve, Kranji Coastal Nature Park, upcoming Lim Chu Kang Nature Park, and Mandai Mangrove and Mudflat Nature Park.

AREA A: JURONG ISLAND Protecting our industrial areas

As one of the world's largest chemicals export hubs, Jurong Island houses critical infrastructure such as power plants and storage facilities. It is also crucial to safeguard mooring space and waterfront access for companies' operation.

