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SYDNEY

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Special Collections & Exhibitions

Living Water

Large print
Exhibition guide

Law Library

Introduction

Water is an ancient, living thing. It has cycled through the atmosphere, soil, oceans, and bodies for billions of years – shaping the land, creating habitats, and sustaining life. As a crucial resource covering over 70% of the planet's surface, water is at the centre of every community, holding social, economic, and cultural importance. Extreme shifts in water patterns, from floods to droughts, disrupt an ecosystem's delicate balance and impact the interconnected relationships among all forms of life. Yet, water remains adaptable and resilient. Despite growing threats posed by pollution, misuse, and climate change, researchers remain committed to discovering solutions to safeguard our marine, freshwater, and urban water systems.

Living Water: 75 years of water research at UNSW connects water research across various environments and disciplines. From seagrass reforestation to aquafarming, hydrology to art, this research speaks to the multitude of ways water shapes existence and impacts survival. By drawing together breakthrough studies, technological innovations, and community engagement efforts, we gain insight into how scientists, engineers, artists, and researchers address

complex challenges related to the stewardship of the planet's water systems. *Living Water* highlights significant contributions made by UNSW toward water governance and security, the support of healthy oceans and resilient coastlines, ensuring safe and equitable access to water, and sharing the knowledge we need to protect this vital resource into the future.

Many of the water systems featured in *Living Water* flow through Aboriginal Land, inscribed with more than 65,000 years of rich history and heritage. We recognise the ongoing relationship the Traditional Owners have with these lands and waters and thank them for their care and protection of these ecosystems for generations. This exhibition takes place on unceded lands of the Bedegal and Gadigal peoples. Always was, always will be, Aboriginal Land.

In celebration of UNSW's 75th anniversary, this exhibition is a collaboration between UNSW Library and UNSW Global Water Institute with funding support from the Faculty of Arts, Design & Architecture, Faculty of Business, Faculty of Engineering, Faculty of Law & Justice, Faculty of Science, and UNSW Library. *Living Water* is presented across all three UNSW Libraries: Main Library, Level 5; Law Library; Art & Design Paddington Library.

Improving technologies for inland aquaculture in Papua New Guinea & Improving peri-urban and remote fish farming in PNG to benefit both community-based and commercial operators

UNSW Aquaculture Research Group
School of Biological, Earth and Environmental Sciences
Faculty of Science, UNSW Sydney

Video: *Fish Farming for Change*. Single-channel video with subtitles, 13:51 minutes.

Credit: Professor Jes Sammut (UNSW), Jon Rawlinson and Dr Ian McLeod (Cinematic Science).

Objects: Aquafarming field equipment, including trawl netting, bouy, traps, data logger, and fish pellets.

Article: “Fishing for peace”

UNSW Magazine, no. 4, issue 40, Summer 2015/16, pages 18-19.

UNSW Archives. S328.

Illustration: Facsimile of a lithograph by J. Green, *Plate XCII: Tilapia nilotica*, 1907.

Credit: *Zoology of Egypt: The Fishes of the Nile*, 1907, by G. A. Boulenger.

Courtesy of Smithsonian Libraries and Archives.

The Papua New Guinea (PNG) inland aquaculture program is led by Professor Jes Sammut (UNSW) and Mr Jacob Wani (Executive Manager, the PNG National Fisheries Authority) and involves researchers from Australian and PNG partner agencies. The project's overarching aim is to increase access to protein through low-cost and environmentally sustainable fish farming systems and practices. The research focuses on clearing bottlenecks to production and improving fish husbandry, fish fingerling supply, and fish nutrition using low-cost approaches. The extension/outreach component facilitates the uptake of fish farming technologies to provide a livelihood for fish farmers and their communities. The project team provides technical support to the National Fisheries Authority (NFA) Fish for Prisons and Fish for Schools Program and a Graduate Certificate in Aquaculture delivered by the Maria Kwin Centre.

Acknowledgements:

Project Liaison: Professor Jes Sammut

Professor Jes Sammut (Project Leader), Mr Jacob Wani, Dr Debashish Mazumder, Mr Joshua Noiney, Sister Pauline Kagl, Mr Gideon Pama, Mr Billy Kerowa, Mr Joe Alois, Mr Micah Aranka, UNSW Aquaculture Research Group, Centre for Ecosystem Science, the PNG National Fisheries Authority, ANSTO, The Maria Kwin Centre, The PNG National Department of Agriculture and Livestock, The Sisters of Notre Dame, The PNG Tribal Foundation. The projects are funded by the Australian Centre for International Agricultural Research (ACIAR) and the PNG National Fisheries Authority.

Restoring endangered *Posidonia australis* seagrass meadows in NSW

Centre for Marine Science and Innovation
School of Biological, Earth and Environmental Sciences
Faculty of Science, UNSW Sydney

Image (framed): *Posidonia australis* provides habitat for iconic species such as White's seahorse. Credit: Photograph by Wild Elements Studio.

Image (display case): *Posidonia australis* seagrass washed onto the beach after storms. Credit: Photograph by Wild Elements Studio.

Book: *Posidonia australis* was first described in 1860 by the botanist Joseph Hooker in *Flora Tasmaniae*. Hooker describes the plant as “Stems short; branches densely covered with long, ragged, white fibres, 2-3 inches long, the remains of old leaves. Leaves 2-3 feet long, 1/3 broad, rounded at tip, nerveless, shining when dry.”

The botany of the Antarctic voyage of H.M. Discovery ships Erebus and Terror in the years 1839-1843, under the command of Captain Sir James Clark Ross. Part III. Flora Tasmaniae, Vol II. Monocotyledones and Acotyledones, 1860
by Joseph Dalton Hooker
Printed in London by Lovell Reeve
KLN 581.99/4 /(7)

Posidonia australis is the largest seagrass in Australia. It supports unique biodiversity and is highly effective at capturing and storing carbon and stabilising shorelines. *Posidonia* grows very slowly, and declines are outpacing recovery. The decline of *Posidonia* has been so dramatic that it is formally listed as endangered in some places in NSW. One of the biggest ongoing threats to *Posidonia* is boat moorings; the movement of mooring chains across the seafloor leaves scars in *Posidonia* meadows, causing them to fragment. Natural recovery of *Posidonia* across the seafloor scars would take many decades without proactive restoration.

Established by marine ecologists in 2018, Operation Posidonia aims to give nature a helping hand and promote the recovery of *Posidonia* by actively restoring areas where it has been lost. It developed as a creative solution for

restoring seagrass meadows without damaging existing habitats. The restoration uses *Posidonia* fragments that become naturally detached from meadows during stormy conditions. Seagrass fragments, often collected by citizen scientists, are replanted by scientists underwater to revegetate areas where *Posidonia* has declined.

Restoration projects in several NSW estuaries show promising results. Operation Posidonia's long-term goal is to establish citizen-led restoration projects around NSW to reverse the loss of this critical habitat. It strives to halt further declines of *Posidonia* by actively engaging with and educating communities, interest groups, and government agencies.

Acknowledgements:

Project Liaison: Erin McCosker and Professor Adriana Vergés
This project is supported by the Australian Research Council, NSW Government through its Environmental Trust, the Wild Elements Foundation, Patagonia Australia, Mosman Council, Port Authority of NSW and the NSW Recreational Fishing Trust. Operation Posidonia is a UNSW and Sydney Institute of Marine Science collaboration and works closely with a range of researchers, the First Nations Gamay Rangers, councils, environmental groups, and citizen scientists.

Improving International Law Regulation of Maritime Autonomous Vessels

School of Global and Public Law
Faculty of Law & Justice, UNSW Sydney

Image (top): Two RAN Bluebottles leaving Jervis Bay just after dawn with sails up catching the first of the morning light. Image courtesy of Ocius.

Image (middle top): Bluebottle BLUEY with sail up 350NM from Broome as part of Operation Roto 7. Image courtesy of Ocius.

Image (middle bottom): Bluebottle BRUCE with sail down powering directly into headwind using propeller. Image courtesy of Ocius.

Image (bottom): Bluebottle BRIZO supporting Operation Roto 7, sail down, photo from ADF Unmanned Aerial Drone. Image courtesy of Ocius.

The use of maritime autonomous vessels (MAVs) creates regulatory and enforcement opportunities and challenges under international law. The aim of this project is to fill a critical gap in current responses by focusing

on the challenges posed by MAVs to international maritime security law. MAVs are increasingly useful for states in peacetime military operations, in response to transnational crime, maritime cybersecurity, and in promoting broader national security goals. For example, uncrewed marine vessels, a type of MAV developed by Australian company Ocius, are deployed to counter illegal fishing by autonomously monitoring designated areas in Australian waters using real-time imagery and advanced technology. These vessels play a crucial role in protecting marine species and enforcing no-take zones, benefiting the environment and legal fishers. However, non-state actors may also use MAVs for terrorist and transnational criminal activity. International law has not kept up with this technology, so this project redresses that problem and proposes law reform to enhance global maritime security.

Acknowledgements:

Project Liaison: Professor Natalie Klein

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UNSW Library Special Collections and Exhibitions

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