

**4th ANZPAC Workshop on Biofouling Management for Sustainable Shipping
1st GEF-UNDP-IMO GloFouling R&D Forum and Exhibition on Biofouling Management**

**Clarendon Rooms, Melbourne Conference & Exhibition Centre
South Wharf, Melbourne,
30 September – 4 October 2019**

Program

Social Meet & Greet		Monday, 30 Sept 2019
1800 - 2000	The Boatbuilders Yard, 23 South Wharf Promenade, South Wharf, Melbourne	
Workshop Day 1 - Morning		Tuesday, 1 Oct 2019
0845 - 0900	<i>Welcome</i> John Lewis, IMarEST / Lilia Khodjet El Khil, GloFouling	
0900 - 0920	<i>Opening address</i> Theofanis Karayannis, Head – Marine Biosafety, International Maritime Organization, UK	
0920 - 0930	<i>Opening address</i> Lyn O’Connell, Deputy Secretary, Australian Government Department of Agriculture, ACT	
Session 1 – Biofouling Risks & Impacts		Chair: John Lewis
0930 - 0955	<i>Ship biofouling: a novel habitat driving ecosystem change in the Anthropocene</i> Ian Davidson, Cawthron Institute, NZ	
0955 - 1020	<i>Impacts of biofouling in aquaculture</i> Nina Blöcher, SINTEF, Norway	
1020 - 1045	<i>Unintended consequences: Disease and pathogen spread in a global economy</i> Sarah Culloty, University College Cork, Ireland	
1045 - 1115	Refreshment Break	
Session 2 - Invasive and Non-Indigenous Marine Species		Chair: Richard Stafford-Bell
1115 - 1135	<i>Are all marine pests equal?</i> Jeff Ross, University of Tasmania, TAS	
1135 - 1155	<i>What’s at stake? Studies on the impacts of non-indigenous species on New Zealand’s marine ecosystems</i> Graeme Inglis, NIWA, NZ	
1155 - 1215	<i>The Australian Priority Marine Pest List (APMPL) – its purposes, genesis, composition and shortcomings</i> Richard Willan, MAGNT, NT	
1215 - 1235	<i>National priority list of exotic environmental pests and diseases</i> Jess Evans, ABARES, ACT	
1235 - 1250	Panel Discussion: Biofouling NIS impacts	
1250 - 1330	Lunch (sponsored by School of Mechanical Engineering, University of Melbourne)	

Workshop Day 1 - Afternoon		Tuesday, 1 Oct 2019
Session 3 – Biofouling Regulations and Requirements		Chair: Sonia Gorgula
1330 - 1345	<i>Australia's biofouling management requirements; minimising risk and regulatory burden</i> Peter Wilkinson, Department of Agriculture, ACT	
1345 - 1400	<i>Evidence-based decision making to underpin New Zealand's CRMS for vessel biofouling</i> Eugene Georgiades, MPI, NZ	
1400 - 1415	<i>What's going on down under: verification and enforcement of New Zealand's biofouling requirements</i> Tracey Bates, MPI, NZ	
1415 - 1430	<i>Lessons learned through implementing and enforcing California's biofouling management regulations</i> Chris Scianni, CSLC, USA	
1430 - 1445	United States of America management of biofouling under the Vessel Incidental Discharge Act Juliette Chausson, US EPA	
1445 - 1500	Canadian commitment to action against AIS Wendy Simmons, Transport Canada, Canada	
1500 - 1520	Panel Discussion: Regulations and Requirements	
1520 – 1540	Refreshment Break	
Session 4 – Offshore		Chair: Justin McDonald
1540 - 1600	<i>Regulation of biofouling risks in the offshore petroleum industry</i> Tim Carter, NOPSEMA, WA	
1600 - 1620	<i>Biofouling management: a shifting paradigm and the value of refocussing on critical safeguards in managing biofouling risk – an industry perspective</i> Johann van der Merwe, Chevron, WA	
1620 - 1640	<i>Cup coral prevention and control actions adopted by the O&G industry</i> Jane Mauro, Petróleo Brasileiro, Brazil	
1640 - 1700	<i>Offshore vessel marine biosecurity – agreeing on best practice</i> Angela Gillham, MIAL, VIC	
1700 - 1730	Panel Discussion: Offshore Biofouling	
Posters & Drinks (sponsored by American Chemet Corp)		Tuesday, 1 Oct 2019
1730 - 1900	Clarendon Rooms, MCEC, South Wharf	

Workshop Day 2 - Morning		Wednesday, 2 Oct 2019
0850 - 0900	Day 2 Welcome & Housekeeping	
Session 5 – Biofouling & Vessel Efficiency		Chair: Nick Hutchins
0900 - 0920	<i>Predicting and monitoring the impact of fouling control coatings on vessel efficiency and emissions</i> Haoling Chen, AkzoNobel, Singapore	
0920 - 0940	<i>Effect of biofouling on ship performance and energy efficiency</i> Yigit Kemal Demirel, University of Strathclyde, UK	
0940 - 1000	<i>Towards bio-fouling management and drag reduction</i> Rey Chin, University of Adelaide, SA	
1000 - 1020	<i>Managing the underwater hull – challenges and opportunities</i> Ralitsa Mihaylova, Safinah Group, UK	
1020 - 1040	<i>In-situ measurements of the ship hull drag penalty due to biofouling</i> Jason Monty, The University of Melbourne, VIC	
1040 - 1050	<i>International collaborative research in ship drag penalty due to hull roughness</i> Bagus Nugroho, The University of Melbourne, VIC	
1050 - 1110	Refreshment Break	
Session 6 - Biofouling Management and Prevention Systems (1)		Chair: James Chapman
1110 - 1130	<i>Taking the rough with the smooth: controlling surface topography as an antifouling strategy – recent progress and new insights?</i> Tim Sullivan, University College Cork, Ireland	
1123 - 1150	<i>Novel antifouling materials for 3D printing and additive manufacture</i> Richard Piola, DSTG, VIC	
1150 - 1210	<i>'Smart' antifouling biocides based on peptides</i> Patrick Cahill, Cawthron Institute, NZ	
1210 - 1230	<i>Antifouling solutions from seaweed biomimetics</i> Bernardo da Gama, Brazil	
1230 - 1250	<i>[Title to be confirmed]</i> Clare Hellio, Université de Bretagne Occidentale, France	
1250 - 1330	Lunch (sponsored by School of Mechanical Engineering, University of Melbourne)	

Workshop Day 2 - Afternoon		Wednesday, 2 Oct 2019
Session 7 – Navy (1)		Chair: Clare Grandison
1330 - 1400	<i>Warships and biofouling: a comparison with commercial ships</i> John Polglaze, RAN / PGM Environment, WA	
1400 - 1420	<i>Using CFD and experiments to estimate impacts of biofouling on ship resistance</i> Eric Holm, NSWCC Carderock, USA	
1420 - 1440	<i>Biofouling challenges for Australia's national shipbuilding enterprise</i> Andrew Scardino, DSTG, VIC	
1440 - 1500	<i>NZDF biofouling management of Navy ships</i> Sarah Strong, New Zealand Defence Force, NZ	
1500 - 1520	<i>Reduction of biofouling on naval vessels in The Netherlands</i> Job Klinjstra, Endures BV, The Netherlands	
1520 – 1540	Refreshment Break	
Session 8 – Navy (2)		Chair: Clare Grandison
1540 - 1600	<i>Navigating the choppy seas of maritime regulation</i> Alex Hayes-Graham, Department of Defence, ACT	
1600 - 1620	<i>Royal Canadian Navy's application of the Canadian Marine Invasives Screening Tool</i> Adam Valenta, Department of National Defence, Canada	
1620 – 1640	Panel Discussion: Navy	
Session 9 – Biofouling Risk Assessment.		Chair: Michael Sierp
1640 - 1700	<i>Next generation pro-active biosecurity management to mitigate the transfer of harmful aquatic species through biofouling</i> Dave Abdo, Department of Primary Industries and Regional Development, WA	
1700 - 1720	<i>Digital biofouling risk assessment using big data</i> Ralitsa Mihaylova, Safinah Group & Richie Ramsden, AkzoNobel, UK	
1720 - 1730	Panel Discussion: Risk Assessment	
ECOSubsea Workshop Dinner		Wednesday, 2 Oct 2019
1900 - 2300	River's Edge, 18-38 Siddeley Street, Melbourne	

Workshop Day 3 - Morning		Thursday, 3 Oct 2019
0850 - 0900	Day 3 Welcome & Housekeeping	
Session 9 – Regional and National Perspectives from Developing Countries		Chair: Lilia Khodet El Khil
0900 - 0920	<i>Overview of the GEF-UNDP-IMO GloFouling Partnerships Project</i> John Alonso, IMO, UK	
0920 - 0940	<i>Threat of the Invasive Alien Species (IAS) introduced through biofouling in Sri Lankan waters</i> Jagath Gunasekera, Sri Lanka	
0940 – 1000	<i>Assessment of national publications on Biofouling/Bioinvasion in Brazil</i> Ricardo Coutinho, Brazil	
1000 - 1020	<i>State of knowledge of non-indigenous marine species along Peruvian waters</i> Patricia Carbajal, Peru	
1020 - 1050	<i>[Title to be confirmed]</i> Anthony Talouli, SREP, Fiji	
1050 - 1110	Refreshment Break	
Session 10 – Domestic, Small and Recreational Vessels and Craft		Chair: Angela Gillham
1110 - 1130	<i>ROVing around marinas: utility of mini ROVs in biofouling management</i> Emily Jones, Ramboll Environ, NZ	
1130 - 1150	<i>Neat and innovative biofouling treatment options that actually work</i> Mike Sierp, Aquatic Biosecurity, SA	
1150 - 1210	<i>Fouling on recreational boats as a major spreading vector of non-indigenous species in the Mediterranean Sea</i> Agnese Marchini, Italy	
1210 - 1230	<i>Biosecurity communications - driving behaviour change to minimise risk</i> Melissa Walker, NSW Department of Primary Industries, NSW	
1230 - 1250	<i>A baseline study of the occurrence of non-indigenous species in Danish harbours</i> Frank Stuer-Lauridsen, LiteHauz, Denmark	
1250 - 1330	Lunch (sponsored by Melbourne Energy Institute, University of Melbourne)	

Workshop Day 3 - Afternoon		Thursday, 3 Oct 2019
Session 11 – In-Water Cleaning		Chair: Eugene Georgiades
1330 - 1350	<i>An independent performance evaluation of a vessel in-water biofouling cleaning and capture system</i> Mario Tamburri, University of Maryland, USA	
1350 - 1410	<i>When theory meets reality: evaluation of protocols for assessing reactive in-water cleaning & capture systems</i> Dan McClary, Ramboll Environ, NZ	
1410 - 1430	<i>Cleaning up the clutter: How is in-water cleaning currently regulated in California?</i> Chris Scianni, California State Lands Commission, USA	
1430 - 1450	<i>Mind the Gap</i> Trecia Smith, Ministry for Primary Industries, NZ	
1450 - 1510	<i>Steps towards an Australian standard for the in-water cleaning of biofouling</i> Sonia Gorgula, DAWR, ACT	
1510 - 1530	<i>Development for assessment and management of the risk arising from the wastes considering in-water hull cleaning activity</i> Jung-Hoon Kang, Korea Institute of Ocean Science and Technology, Korea	
1530 – 1550	Refreshment Break	
Session 12 – Hull Grooming		Chair: Richard Piola
1550 - 1610	<i>In-water grooming to maintain ship hulls: from research to reality</i> Geoff Swain, Florida Institute of Technology, USA	
1610 - 1630	<i>Development of a test apparatus and method of evaluating the impact of hull cleaning tools on coating wear and biocide release</i> Eric Holm, Naval Surface Warfare Center, USA	
1630 - 1650	<i>Chemical compositions and toxicity potentials of antifouling biocides released during ships' hull cleaning by hydroblasting</i> Moonkoo Kim, Korea Institute of Ocean Science and Technology, Korea	
1650 - 1710	<i>Exploring vessel in-water cleaning as a source of ocean microplastics</i> Mario Tamburri, University of Maryland, USA	
1710 - 1730	Panel Discussion: In-water Cleaning and Hull Grooming	

Industry Panel		Thursday 3 Oct 2019
1730 - 1900	Clarendon Rooms, MCEC, South Wharf	

Workshop Day 4 - Morning		Friday, 4 Oct 2019
0850 - 0900	Day 4 Welcome & Housekeeping	
Session 13 – Pathogens and Diseases		Chair: Eugene Georgiades
0900 - 0925	<i>Vessel biofouling as a route for transmission of pathogens</i> Marty Deveney, SARDI Aquatic Sciences, SA	
0925 - 0950	<i>Understanding environmental detection of aquatic pathogens to inform vessel management policy in Australia</i> Tim Carew, DAWR, ACT	
0950 - 1015	<i>Biofouling and aquatic pathogens: the case study of the Ostreid Herpesvirus 1</i> Marine Fuhrmann, The University of Sydney, NSW	
1015 - 1045	Panel Discussion: Pests and Diseases	
1045 - 1105	Refreshment Break	
Session 14 – Non-Shipping Sectors – Aquaculture, Offshore Energy		Chair: John Alonso
1105 - 1125	<i>Biofouling management in New Zealand salmon farms: challenges and directions</i> Lauren Fletcher, Cawthron Institute, NZ	
1125 - 1145	<i>NZ's Shellfish Aquaculture Research Platform - integrated biofouling management</i> Patrick Cahill, Cawthron Institute, NZ	
1145 - 1205	<i>Managing corrosion and biofouling of the offshore monopile supports for wind turbines</i> Geoff Swain, Florida Institute of Technology, USA	
1205 - 1225	<i>Monitoring biofouling, and testing antifouling coatings, in the offshore renewable energy industry</i> Andrew Want, Heriot-Watt University, UK	
1225 - 1245	Panel Discussion: Biofouling in aquaculture: impacts and management	
1245 - 1325	Lunch (sponsored by Melbourne Energy Institute, University of Melbourne)	

Workshop Day 4 - Afternoon		Friday, 15 Sept 2017
Session 15 – Future Strategies for Risk Assessment & Management		Chair: Peter Wilkinson
1325 - 1345	<i>Critical coastal values and thresholds of acceptable change: A 21st Century risk model to effectively deal with introduced species</i> Marnie Campbell, Murdoch University, WA	
1345 - 1405	<i>Introduction to BioPass, a simple, pragmatic solution designed to manage biofouling for the international shipping industry</i> Rowan Fenn, rise-x.io Technologies, WA	
1405 - 1425	<i>The use of eDNA for detecting the presence and spread of invasive species</i> Craig Sherman, Deakin University, VIC	
1425 - 1445	<i>[Title to be confirmed]</i> Prakash Mussai, Mauritius Oceanography Institute, Mauritius	
1445 - 1505	<i>Building stronger scientific understanding on the dynamics and pathways of marine invasive species introductions via biofouling - a case for international scientific cooperation on ocean observations, data management, capacity development and technology transfer</i> Ward Appeltans, IOC-UNESCO, Belgium	
1505 – 1525	Refreshment Break	
Session 16 – The Way Forward		
1525 - 1600	Panel Discussion: The Way Forward	
1600 - 1620	Workshop/ Forum Close Theofanis Karayannis, IMO / John Lewis, IMarEST	

Posters		1-4 Oct 2019
P001	<i>Ecological engineering of marine infrastructure for biosecurity</i> Nina Schaefer, Sydney Institute of Marine Science, NSW	
P002	<i>Biological risk assessment approach for establishing in-water cleaning criteria of ship's hull fouling</i> Min-Chiu Jang, Korea	
P003	<i>Combating biofouling through research. DST Marine infrastructure.</i> Jim Dimas, DSTG, VIC	
P004	<i>3D printed antifouling material and micro-UV LED for protection of marine optics</i> Richard Piola, DSTG, VIC	
P005	<i>In-water cleaning in NSW waters</i> Melissa Walker, NSW Department of Primary Industries, NSW	

Exhibitors		1-4 Oct 2019
E001	CleanSubSea / Franmarine, WA	
E002	Hempel (Australia)	
E003	Inchcape Shipping Services	