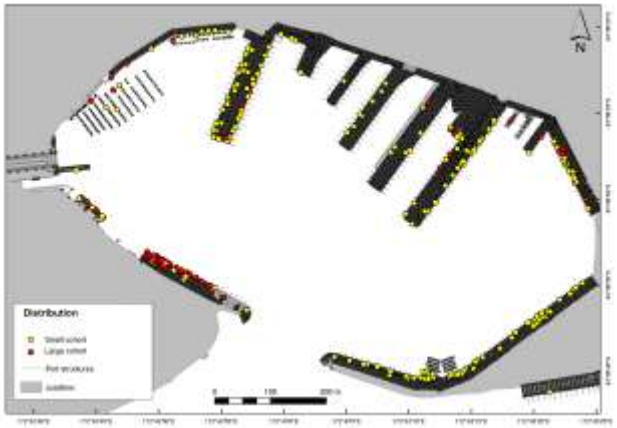
NIWA Taihoro Nukurangi

CAWTHRON The power of science®

THE UNIVERSITY OF WAIKATO Te Whare Wānanga o Waikato

Crowd-sourcing the globe for innovative tools for marine pest control



Quadrilateral scientific collaboration in marine biosecurity

Smithsonian Environmental Research Center

GOVERNMENT OF WESTERN AUSTRALIA
Department of Primary Industries and Regional Development

Fisheries and Oceans Canada
Pêches et Océans Canada

Australian Government
Department of Agriculture and Water Resources

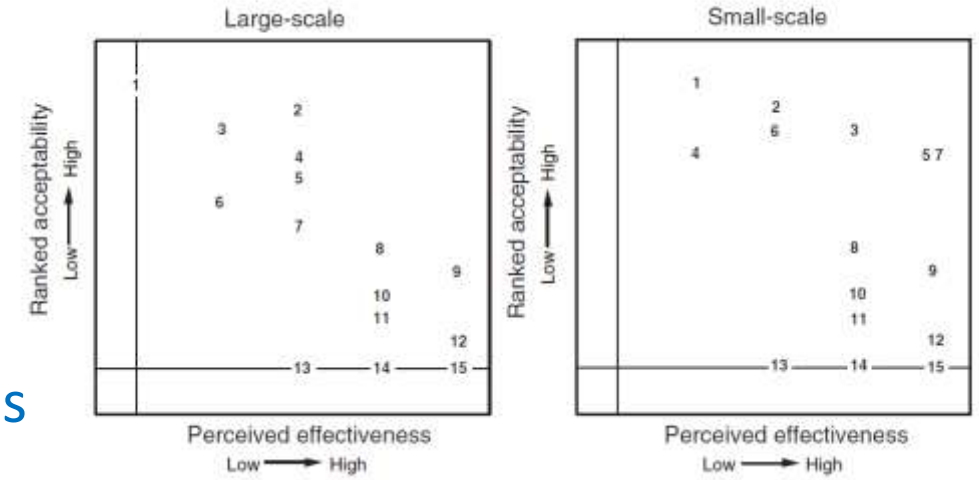
International relationships fund

New Zealand Government
Funded by the Ministry of Business, Innovation and Employment

Research Aims

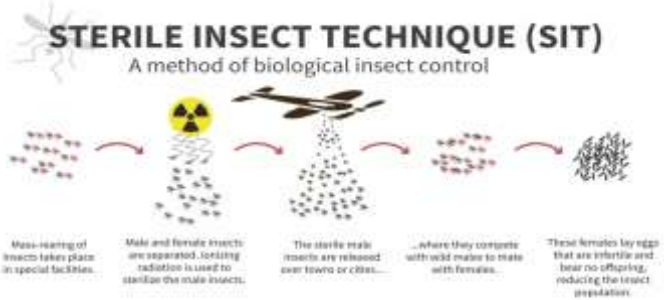
Challenges for marine pest control

- Detection at low densities
- Containment
- Working underwater
- High cost
- No effective large-scale tools
- Regulatory constraints
- Social license



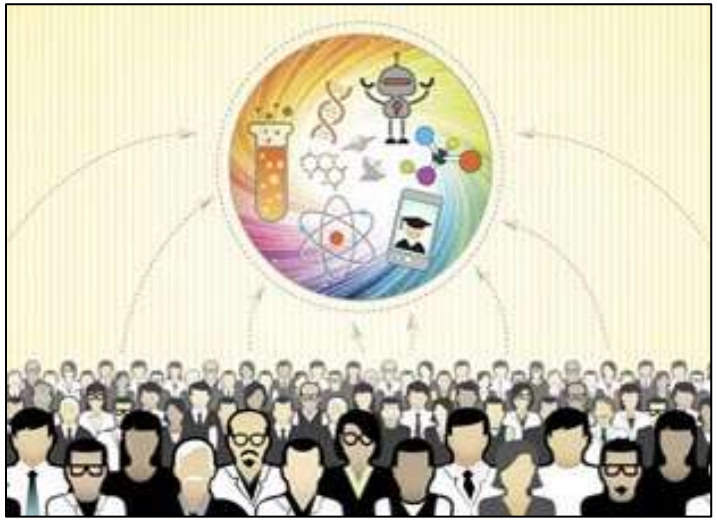
Thresher, R.E., Kuris, A. M. (2004) Options for managing invasive marine species. Biological Invasions 6:295-300.

…compared to above the water



A global, crowdsourced competition for ideas – ‘innovation jam’

- Large diversity of technical interests deployed on the problem
- Solutions more likely from areas of technical expertise that are distinct from the discipline the problem arose in



INNOCENTIVE®

www.innocentive.com

Key stats

2000 +

External Challenges

62,000+

Total Solutions Submitted

$50 + Million

Total Dollars Posted

380,000+

Solvers

Nearly 200

Countries

‘Ideation challenge’

- Innovative concepts for containing, neutralising or exterminating marine pest individuals or vulnerable life-history stages
- Scope (e.g. no vessel hulls, beyond detection)
- Criteria (H&S, side-effects etc.)

The process

July 2017

Propose the idea for the challenge

Sept. 2017- Feb. 2018

Refine into a specific challenge question & specify IP arrangements

March.-May 2018

Post the challenge on www.innocentive.com

Evaluate the submissions

May – June 2018

Award the prize

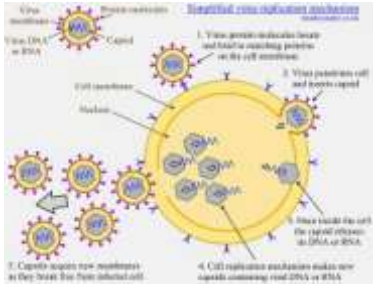
Global distribution of solvers

27 solutions submitted

What was submitted?

- Innovative ideas
  - autonomous robotics,
  - image recognition systems,
  - acoustics,
  - genomics
  - marine chemistry
  - delivery systems
  - biological control…….

  - and some oddballs!

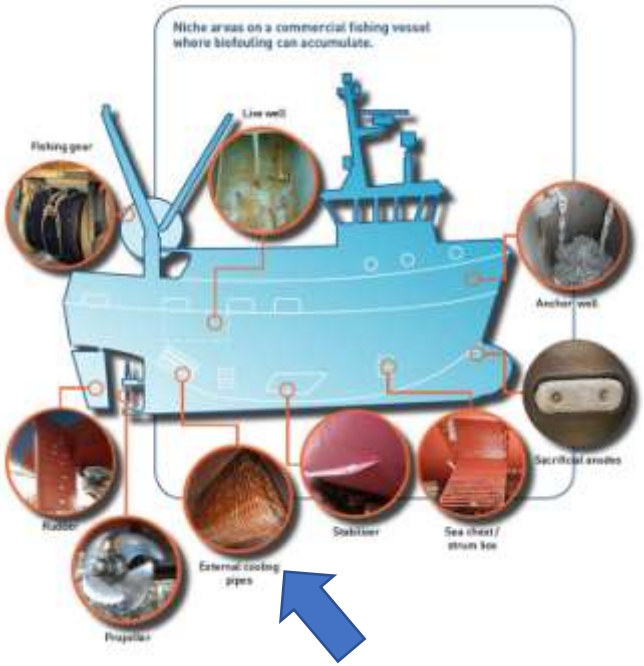


The winners …..

- Two solutions rewarded
  1. Targeted delivery system for DNA transfection / sterilization
  2. Use of acoustics and chemicals to lure and repulse marine pests (Smart traps)

Next steps

- Explore scope and options for progressing these concepts collaboratively
- Reflect on process
- Treatment of biofouling in box-coolers (August 2018)



Australian Government
Department of Agriculture and Water Resources

Acknowledgements

International Steering Group

Justin McDonald, Greg Ruiz, Tom Therriault, Peter Wilkinson, Marnie Campbell

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HIKINA WHAKATUTUKI

Australian Government
Department of Agriculture and Water Resources

Fisheries and Oceans Canada
Pêches et Océans Canada

GOVERNMENT OF WESTERN AUSTRALIA
Department of Primary Industries and Regional Development