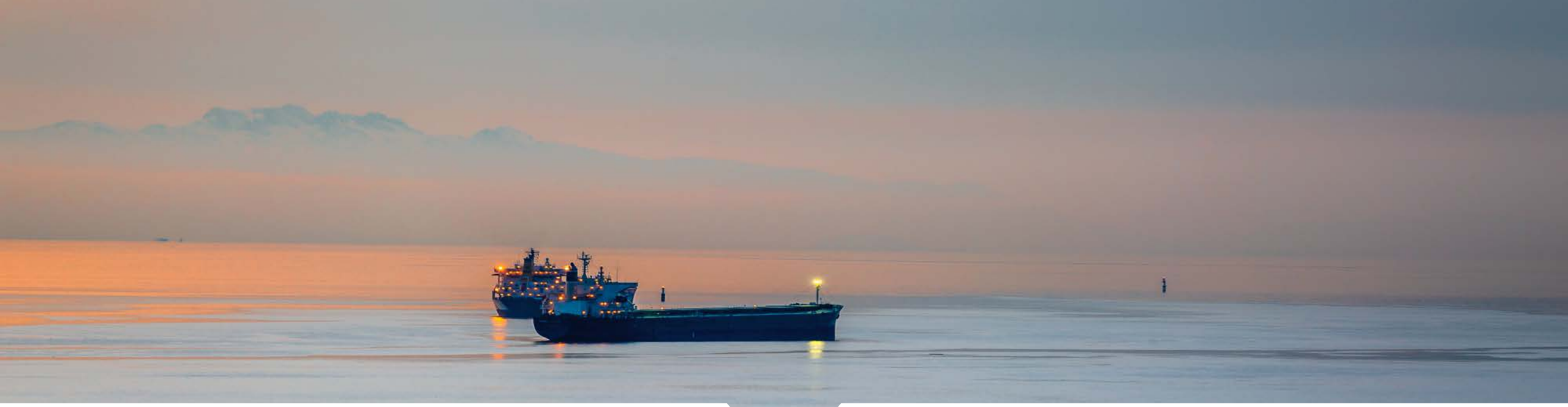


CENTRE POUR LE TRANSPORT MARITIME RESPONSABLE

ClearSeas

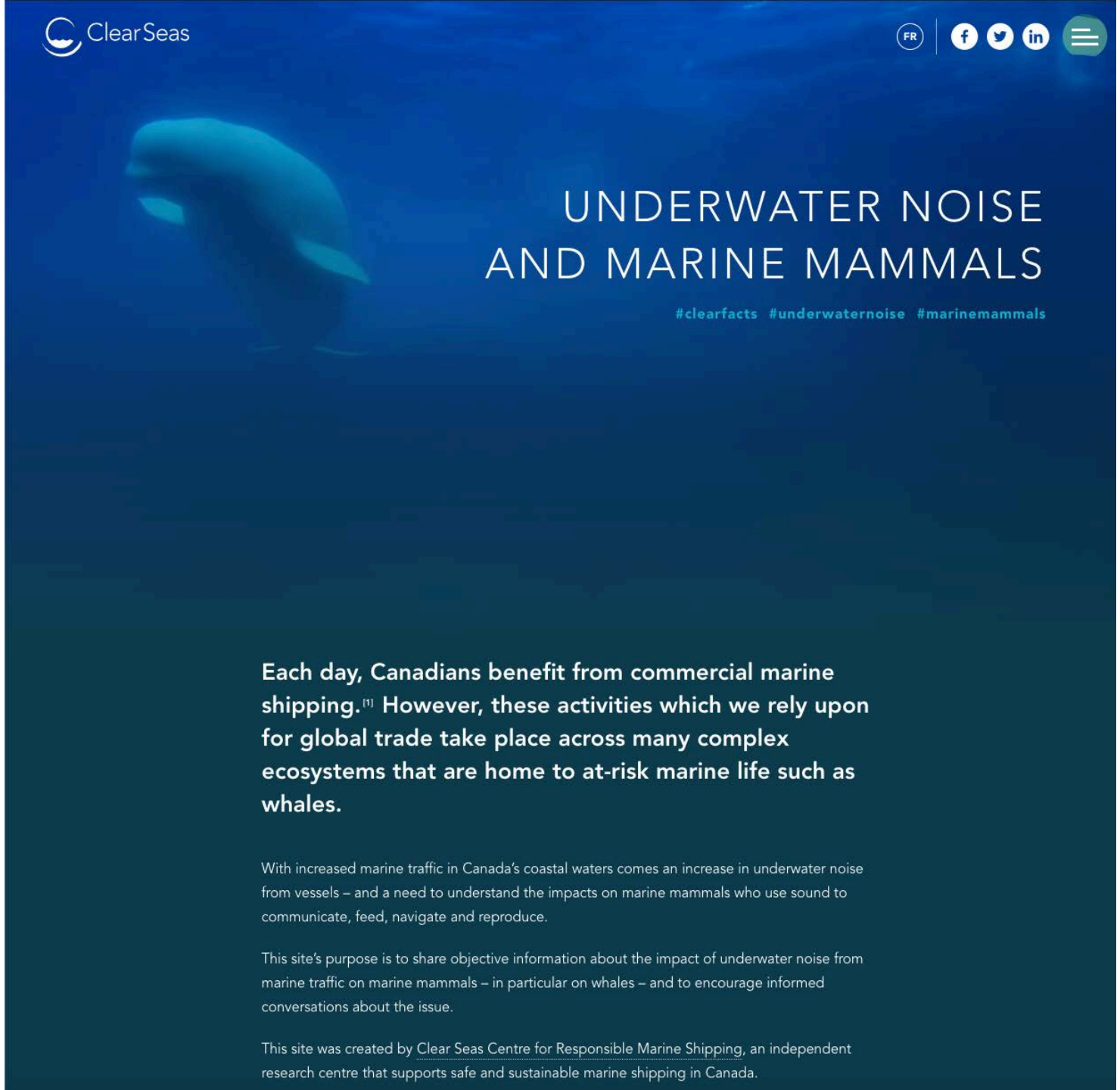
CENTRE FOR RESPONSIBLE MARINE SHIPPING

Developing Innovative Solutions to Ship-Source Underwater Noise

Research Project Concept Outline for CISMaRT 2020

November 2020

clearseas.org

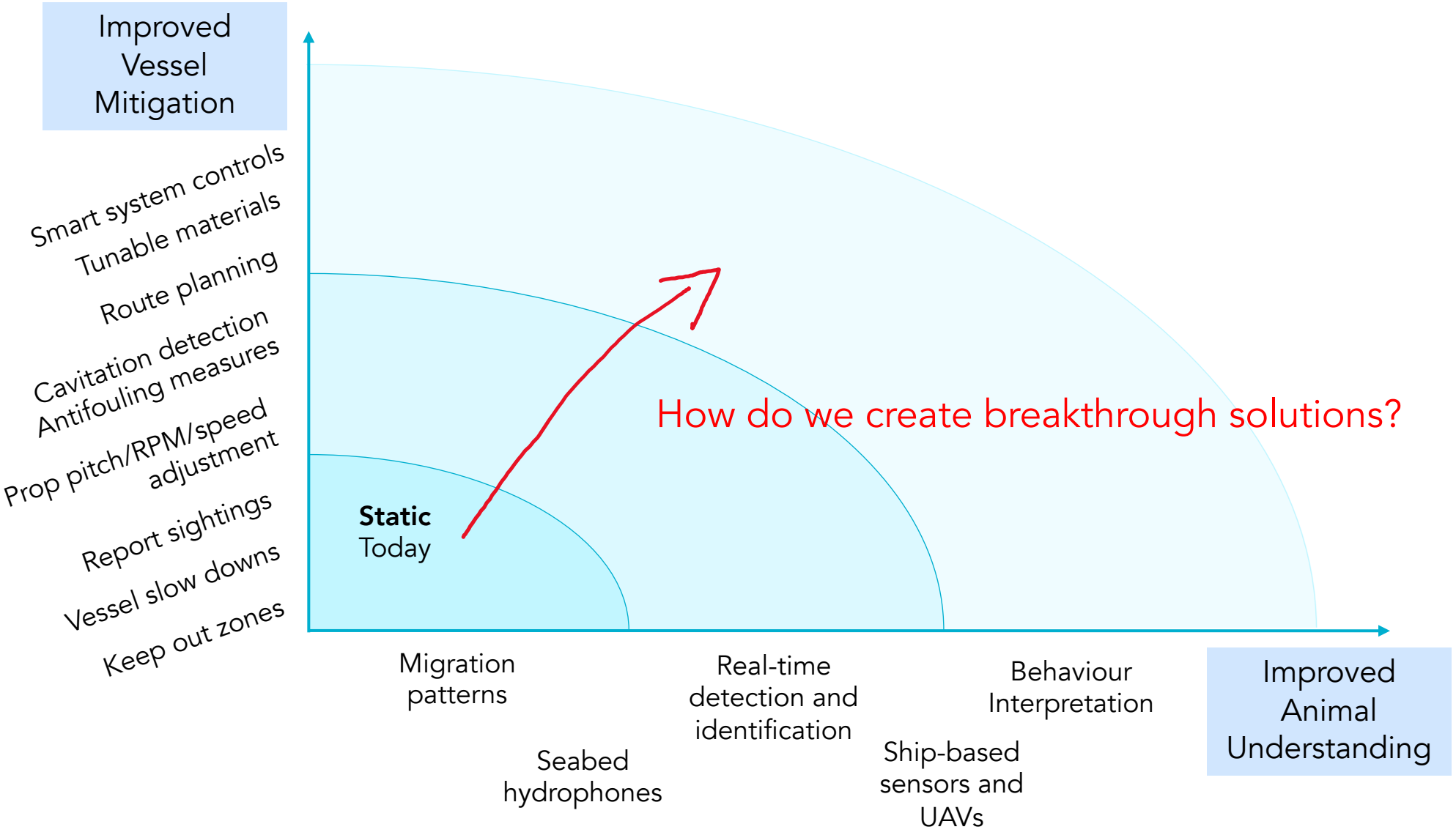


ClearSeas

Visit:

clearseas.org/underwater-noise

HORIZONS FOR SOLUTION DEVELOPMENT



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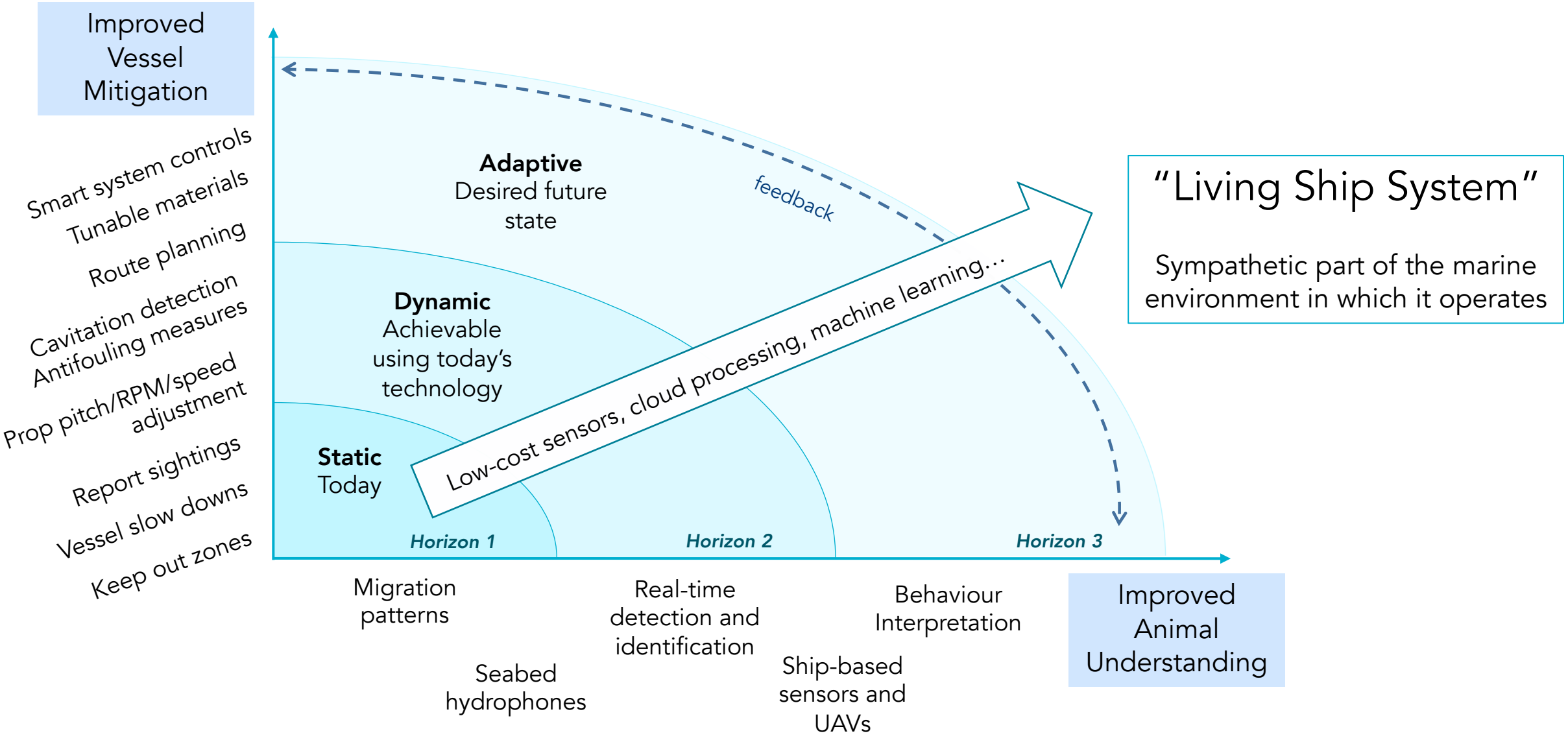


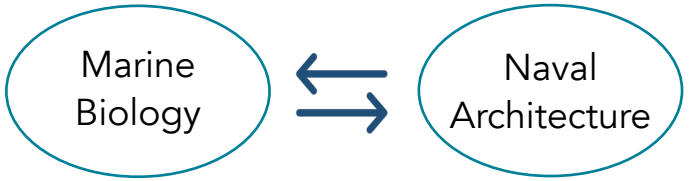
"Living Ship System"

Sympathetic part of the marine environment in which it operates

OPPORTUNITY

How can we leverage emerging technologies through interdisciplinary collaboration in order to develop new solutions to reduce marine mammal disturbance from underwater noise?

- Can we use machine learning to process data and predict noise in real-time onboard vessels?
- How can ships help us to improve our understanding of the sensitivity and response of marine mammals to underwater noise?
- Will noise reduction strategies also help meet industry decarbonization targets or reduce costs in the long run?
- What will the next generation of ships look like?



Need knowledge exchange across disciplines

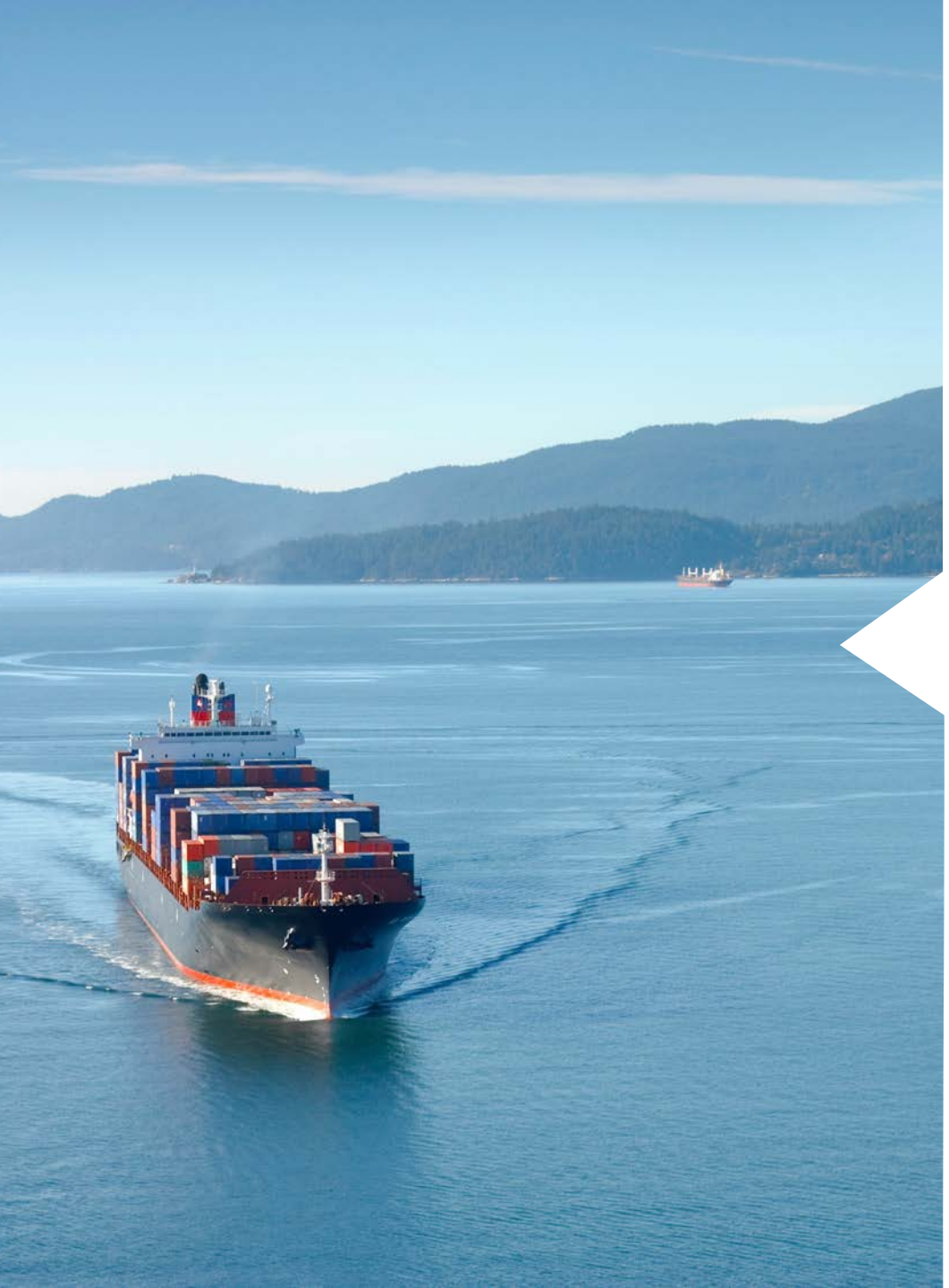
RESEARCH OBJECTIVES

Looking to the future: Designing ships with URN mitigation in mind

- Smart hulls, tunable propellers, mobile hydrophones?
- AI, machine learning, cloud processing – available onboard?

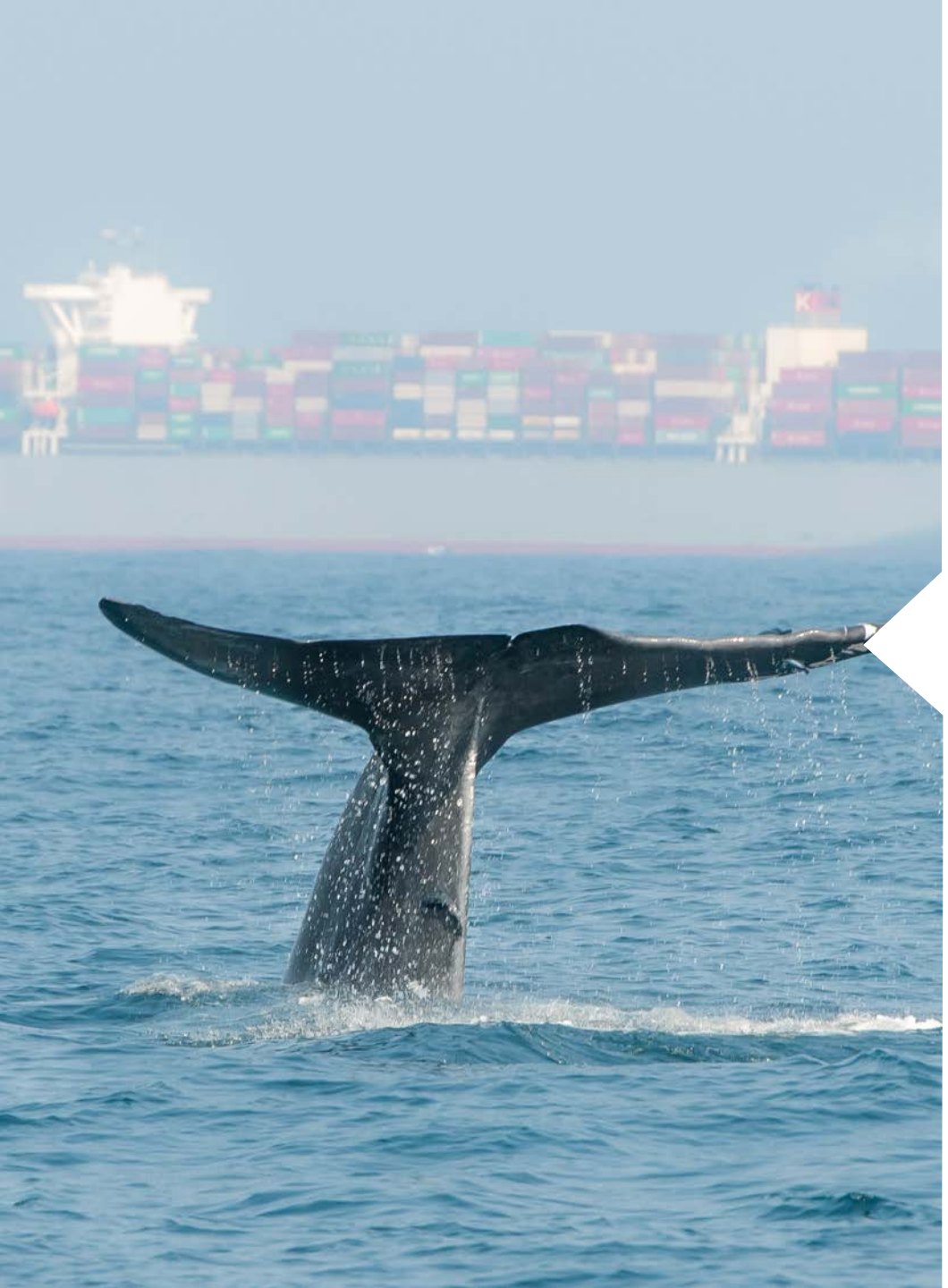
Create novel system-based solutions to the negative impacts of underwater noise on marine mammals

- Use full suite of AI and machine learning to predict URN onboard vessels during operations and assess marine mammal response to vessel noise mitigation strategies
- Deploy smart adaptive strategies leveraging new materials, sensors and controls to mitigate noise and avoid ship strikes
- Cross boundaries of naval architecture, oceanography, marine biology – create partnerships in academia and industry
- Find the win-win solutions (e.g. quieting vessels while reducing emissions and increasing fuel efficiency)



PROPOSED APPROACH

- University collaborative research program, multi-year project jointly led from Naval Architecture and Marine Biology
- MASc/PhD students from each discipline
- Post-doctoral research fellow to manage project
- Clear Seas to provide funding in partnership with other industry collaborators - matched with Mitacs, NSERC and other sources of funding



WE ARE LOOKING FOR

- Feedback on the project approachj
- Potential academic research partners
- Industry collaborators
- Funding agency support

Contact: paul.blomerus@clearseas.org