Reducing seabird bycatch through improving management of fisheries waste

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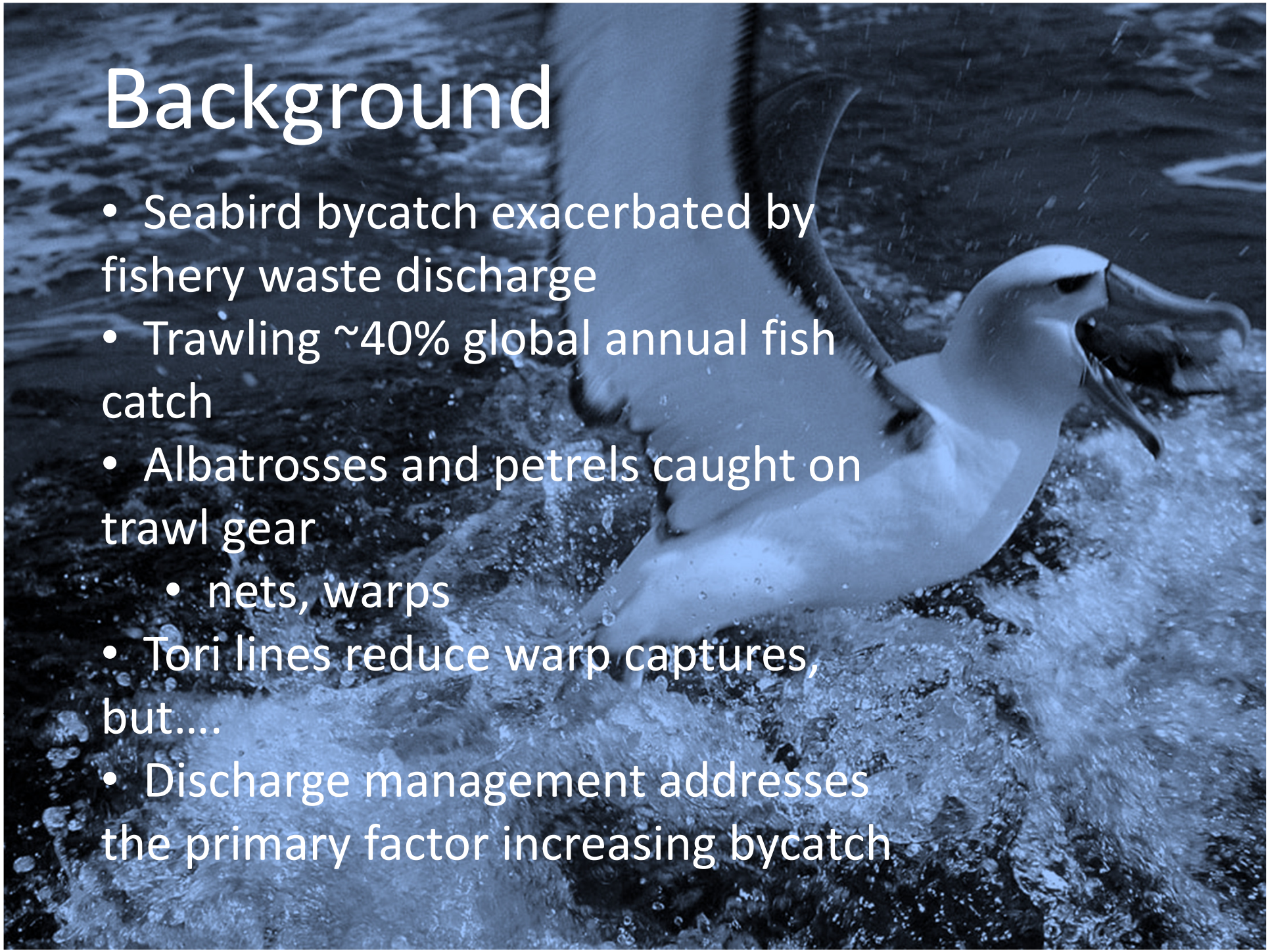
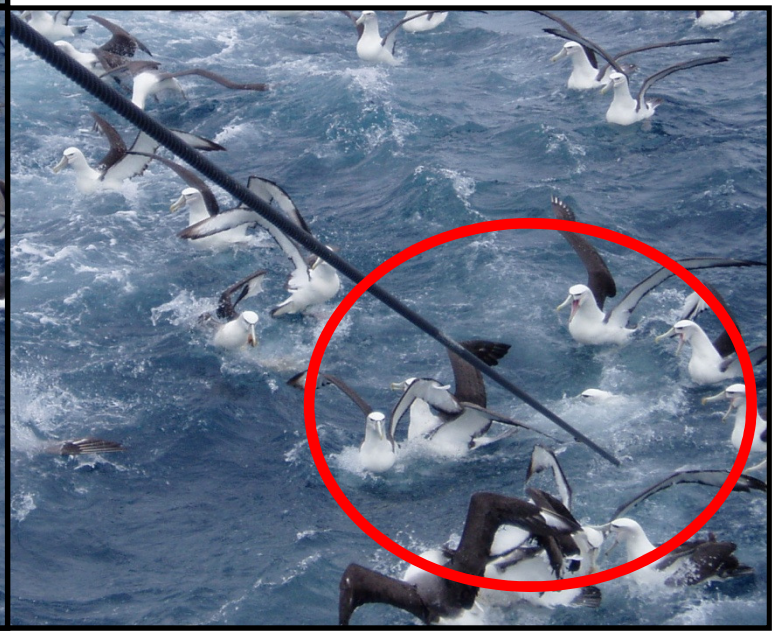


Background

- Seabird bycatch exacerbated by fishery waste discharge
- Trawling ~40% global annual fish catch
- Albatrosses and petrels caught on trawl gear
  - nets, warps
- Tori lines reduce warp captures, but….
- Discharge management addresses the primary factor increasing bycatch

Warp strikes



Photos: DOC, MPI

Objective

- To investigate a variety of fishery waste management regimes to reduce the risk of seabird bycatch on trawl gear

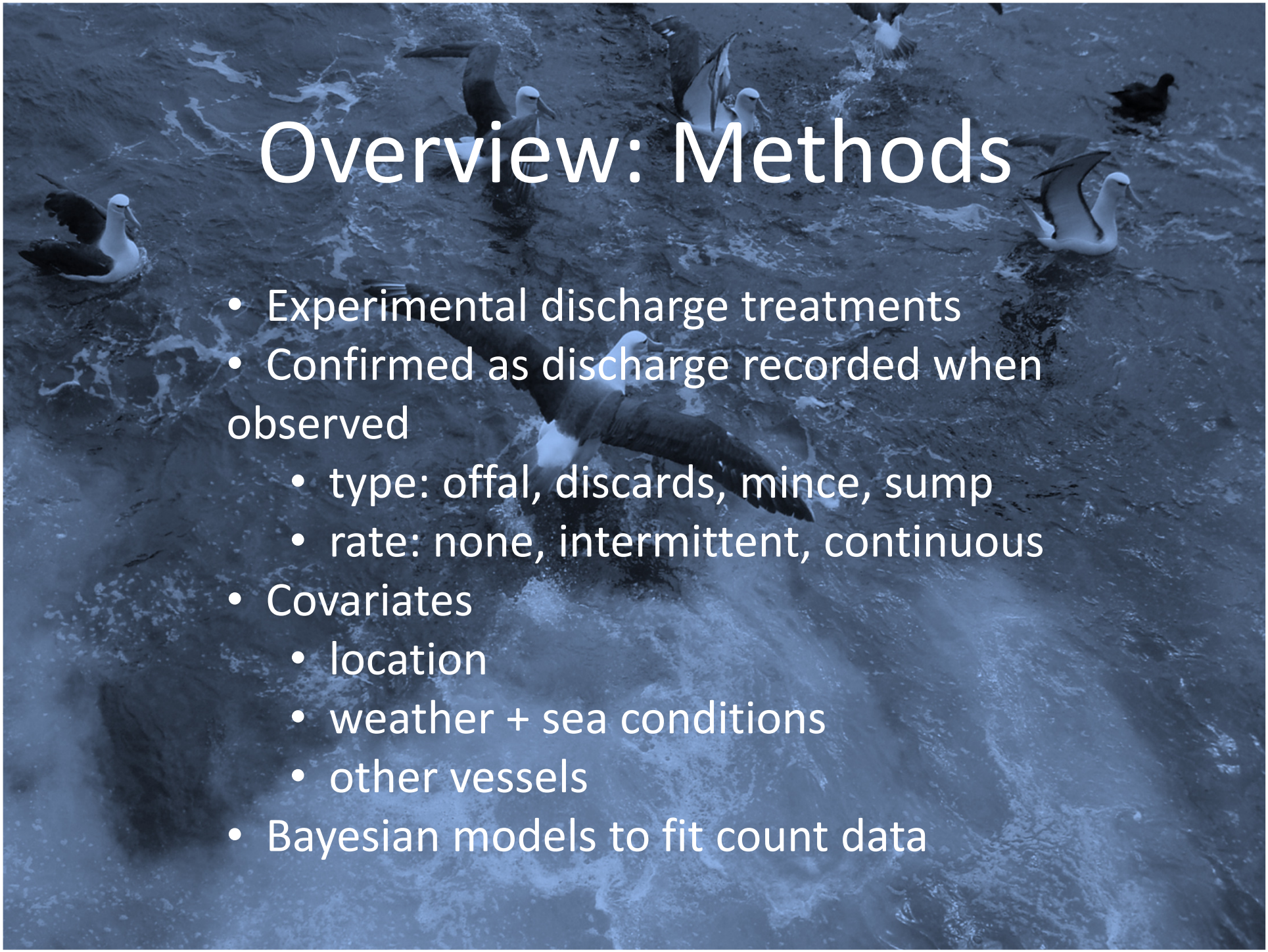
- 7-year research programme
- Vessel-based experiments
- Investigated effects of:
  - different durations of holding periods
  - different forms of fish waste discharge
- Identified management approaches relevant to operational capabilities

Overview: Methods

- New Zealand trawl fisheries
  - range of target species
  - different fishing areas
  - trawl vessels ≥ 28 m in length
- 5 experiments 4 – 6 weeks in duration
- 3 – 4 treatments per experiment
- Randomised block design
  - 24-hour treatments changed at midnight
  - Pre-specified order of treatments
- Dedicated government observers

Overview: Methods

- Response: Seabird abundance in two areas astern
  - before and after discharge events
  - albatrosses + giant petrels
  - cape petrels
  - other petrels + shearwaters
  - 10-m radius semicircle (incl. trawl warps)
  - 40-m radius semicircle
  - Counted using repeated sweeps through two areas over 60 minutes

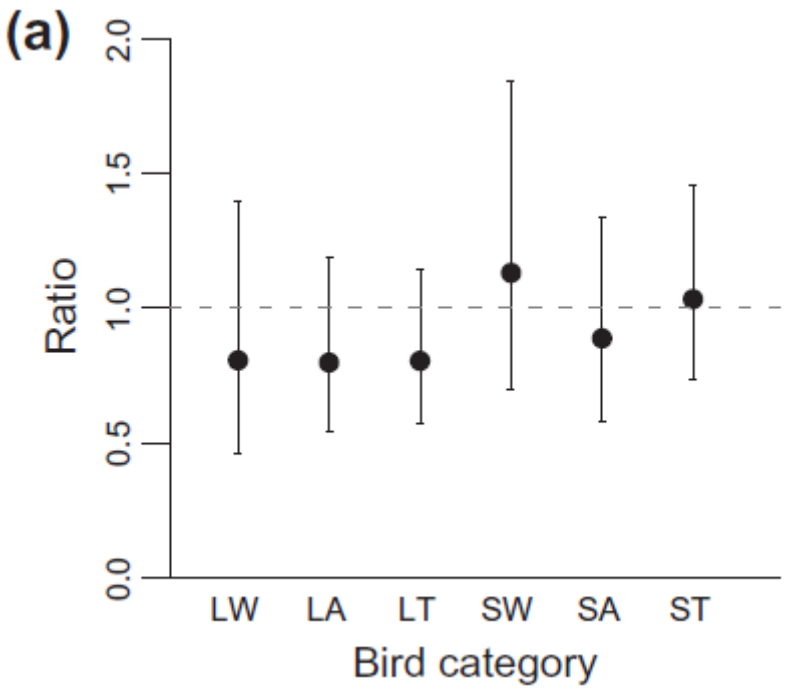


Overview: Methods

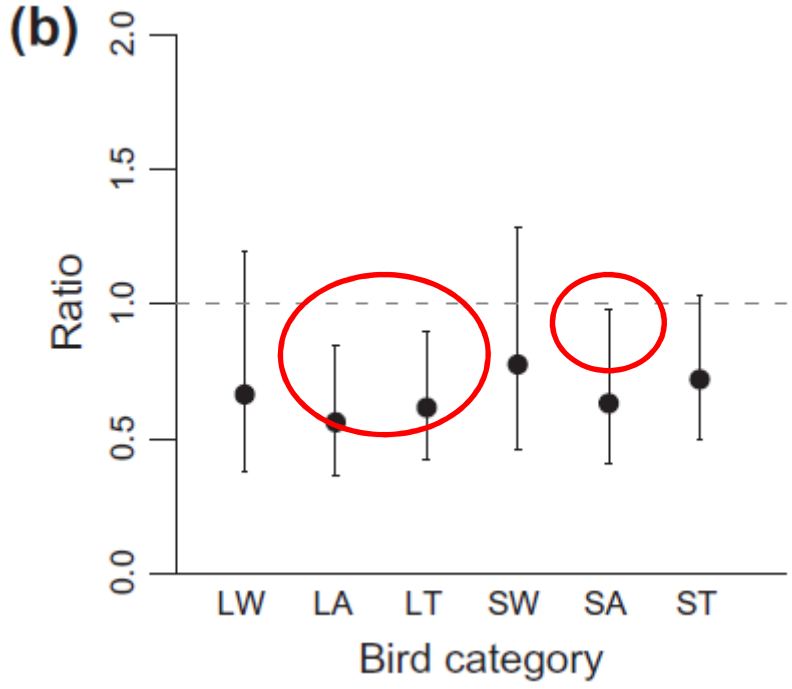
- Experimental discharge treatments
- Confirmed as discharge recorded when observed
  - type: offal, discards, mince, sump
  - rate: none, intermittent, continuous
- Covariates
  - location
  - weather + sea conditions
  - other vessels
- Bayesian models to fit count data

Results: Batch discharge

- Waste held for a specified period, then dumped as quickly as possible

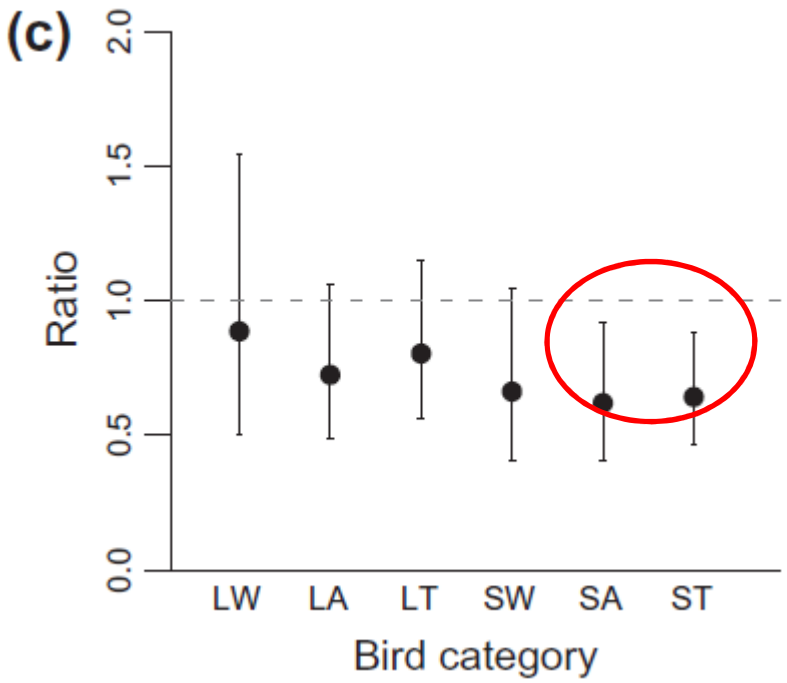


2 h vs. 30 min holding period



4 h vs. 30 min holding period

Results: Batch discharge

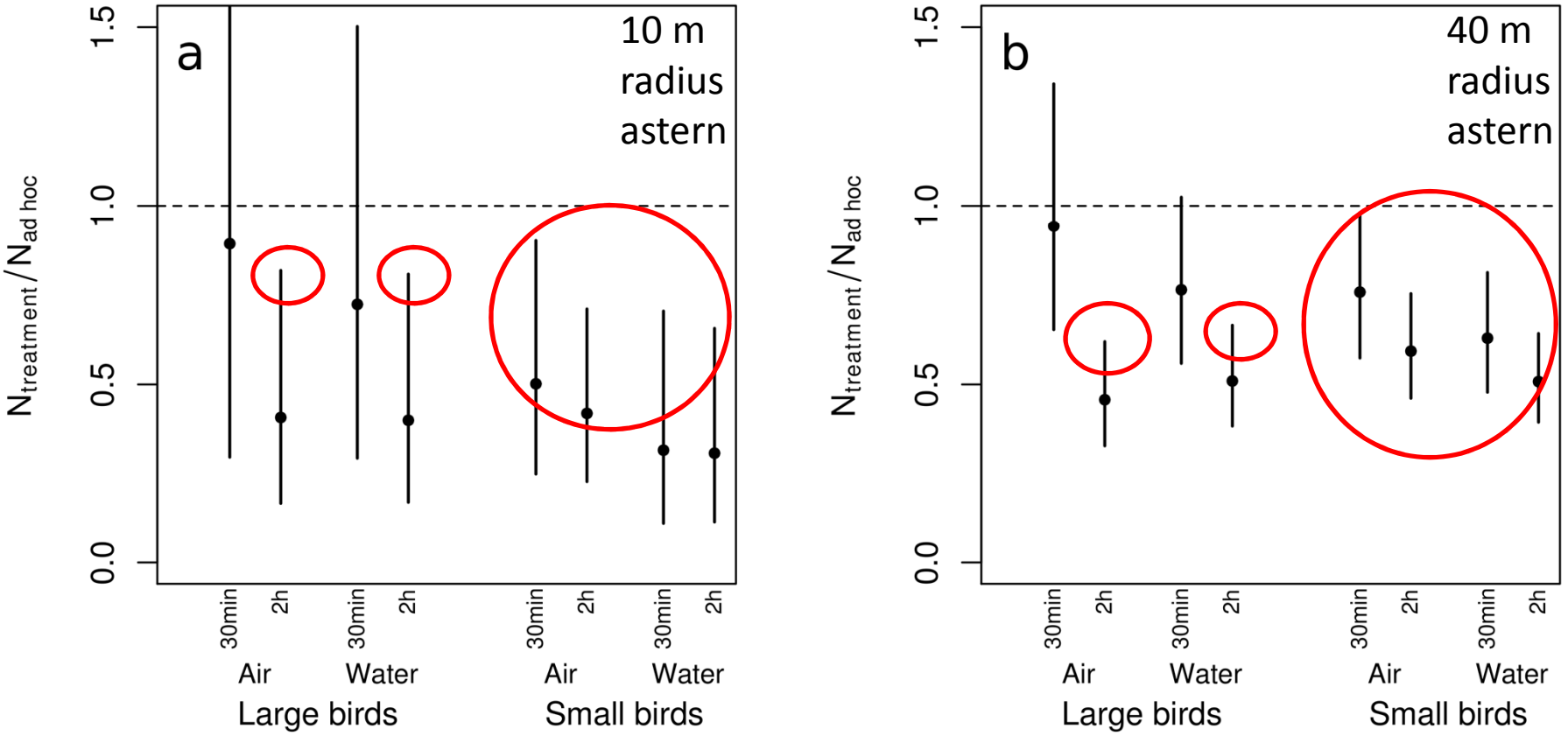


8 h vs. 30 min holding period

Pierre et al. 2010. Biological Conservation 143: 2779–2788.

Results: Batch discharge

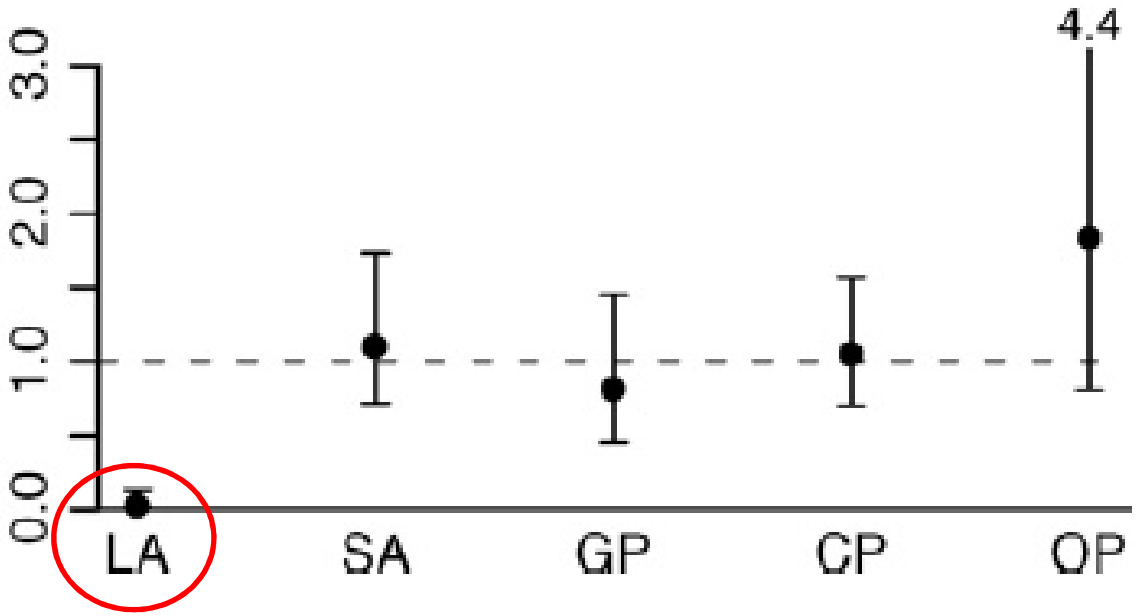
- Ad hoc discharge compared to waste held for a specified period, then dumped as quickly as possible



Pierre et al. 2012. Fisheries Research 131 – 133: 30 – 38.

Results: Minced discharge

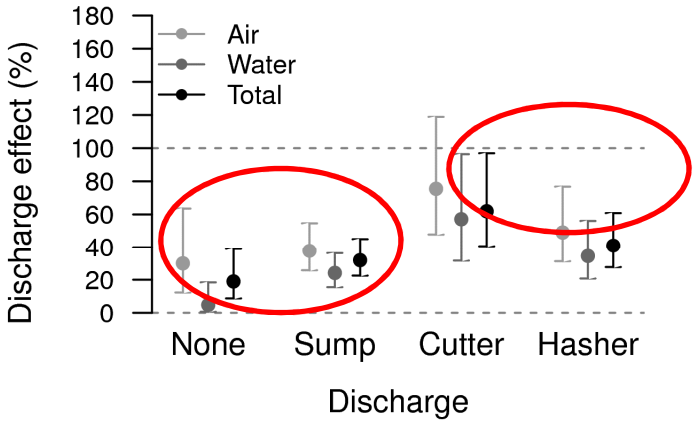
- Birds feeding on minced waste discharge vs. offal discharge



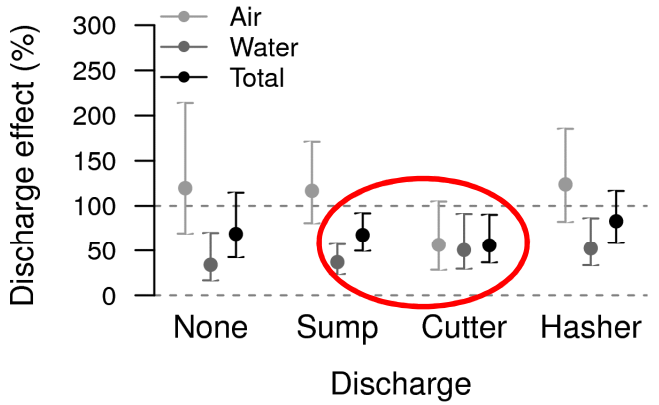
Abraham et al. 2009. Fisheries Research 95: 2010 – 219.

Results: Minced discharge

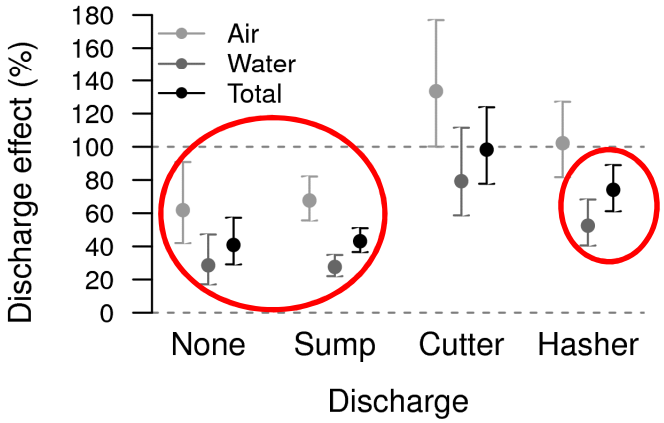
(b) Large albatross, 40m



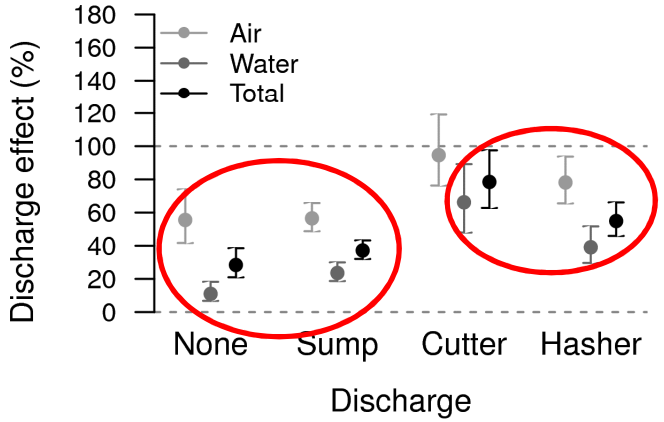
(f) Cape petrel, 40m



(d) Small albatross, 40m



(h) Other petrel, 40m



Pierre et al. 2012. Emu 112: 244–254.

Results: Minced discharge

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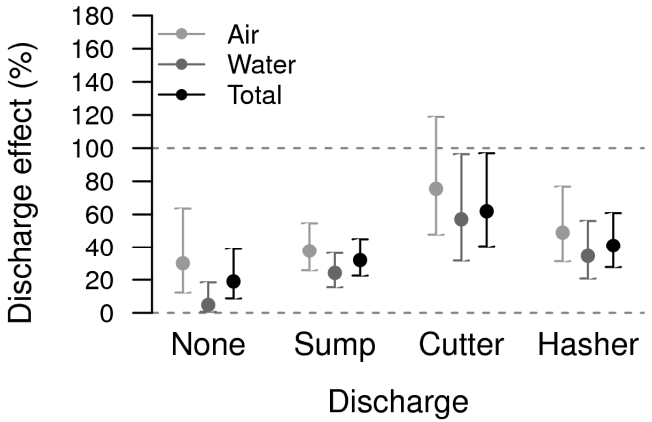

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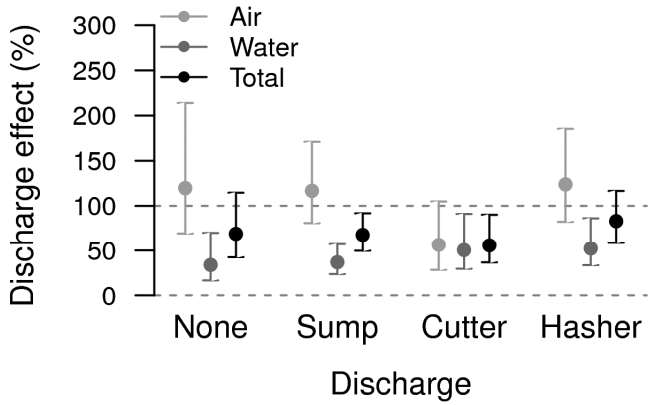

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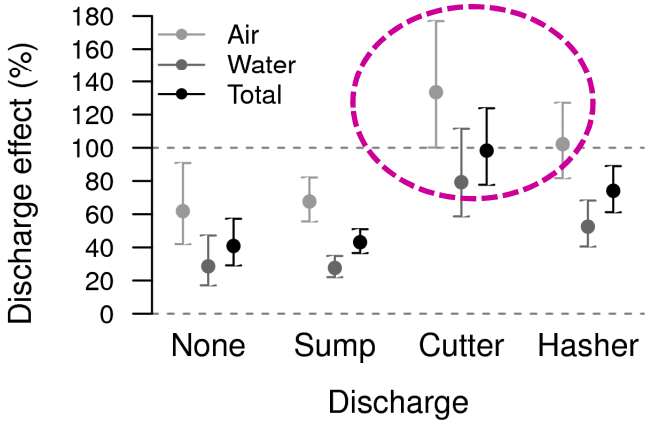

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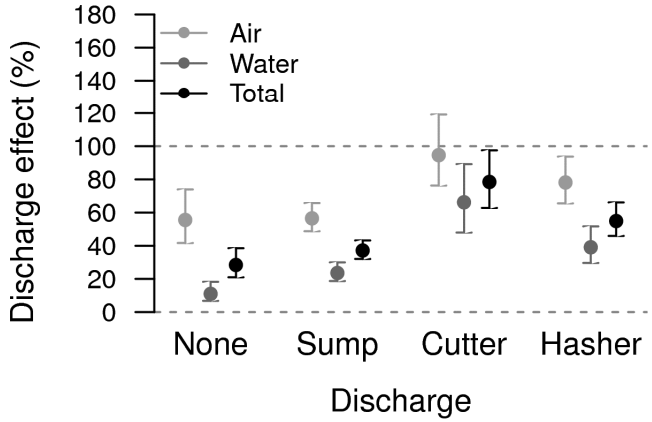

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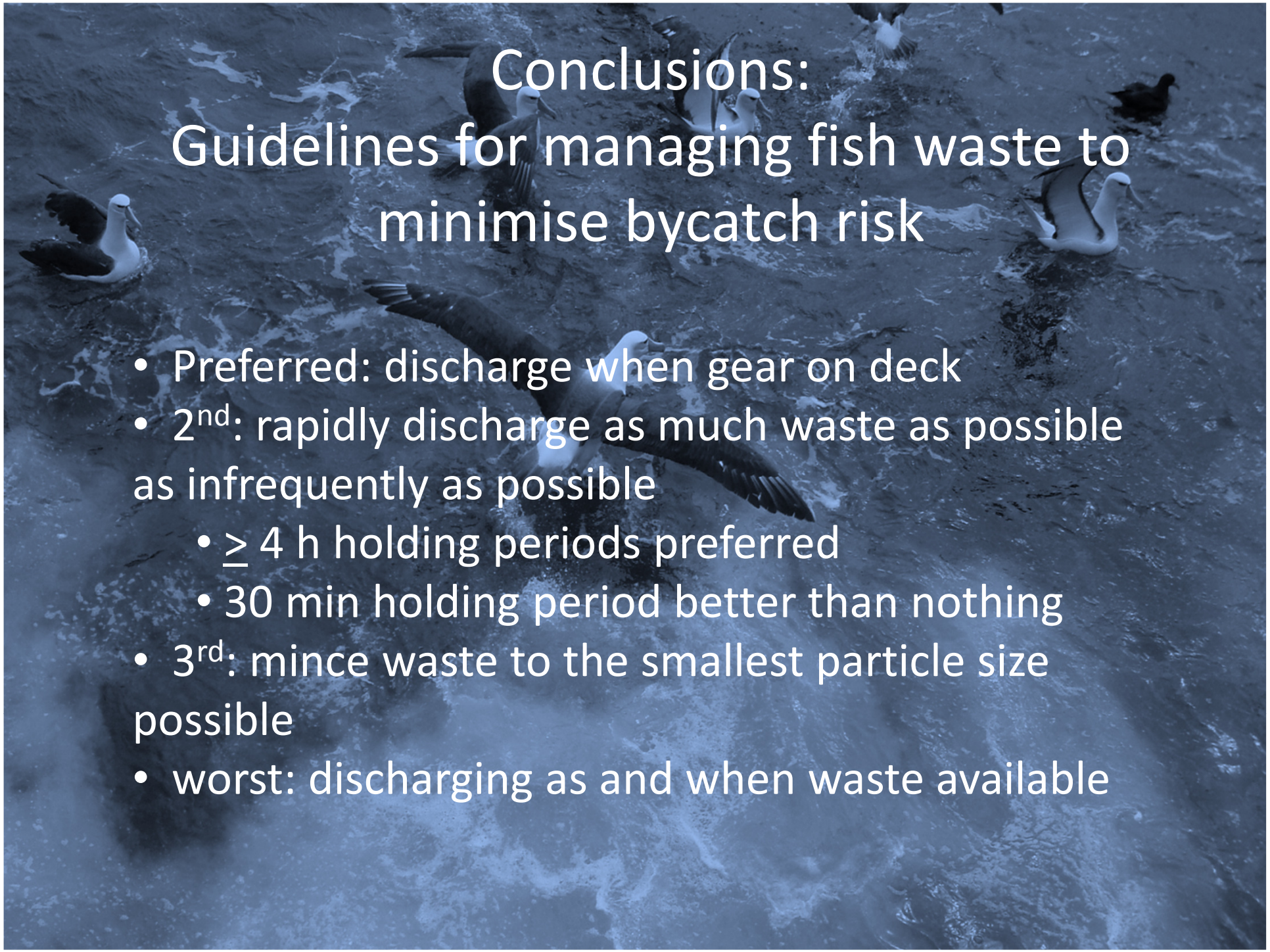
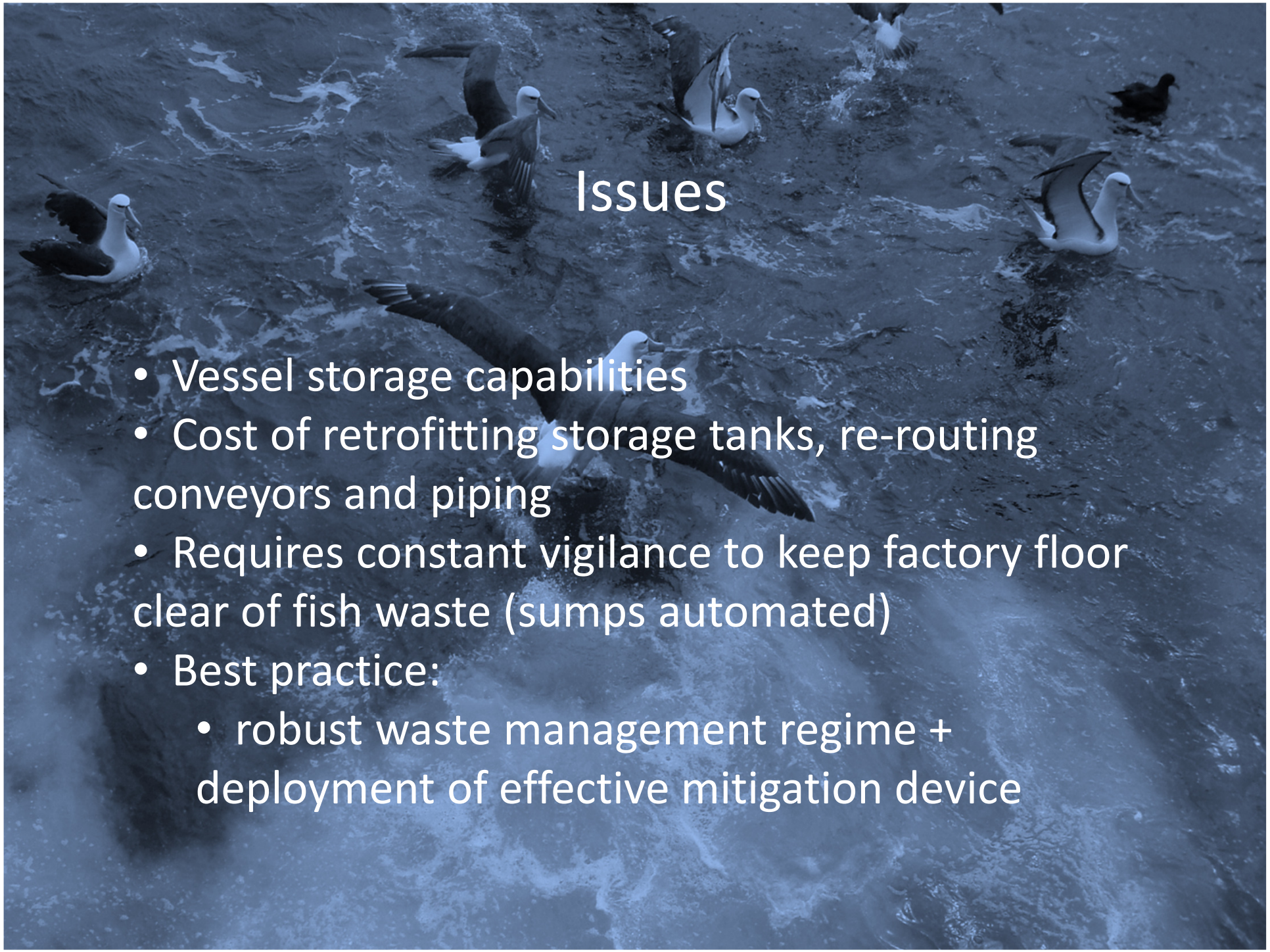


Conclusions:
Guidelines for managing fish waste to minimise bycatch risk

- Preferred: discharge when gear on deck
- 2nd: rapidly discharge as much waste as possible as infrequently as possible
  - ≥ 4 h holding periods preferred
  - 30 min holding period better than nothing
- 3rd: mince waste to the smallest particle size possible
- worst: discharging as and when waste available



Issues

- Vessel storage capabilities
- Cost of retrofitting storage tanks, re-routing conveyors and piping
- Requires constant vigilance to keep factory floor clear of fish waste (sumps automated)
- Best practice:
  - robust waste management regime + deployment of effective mitigation device

Result!

Science-based management that reduces seabird bycatch risk

Photo: DOC, MPI

"Albert Times": *www.fishinfo.co.nz/albertross.htm*

Thanks to:

Sanford Ltd, Sealord Ltd, skippers, crews, onshore managers, Deepwater Group Ltd, Agreement on the Conservation of Albatrosses and Petrels, Department of Conservation, Ministry of Fisheries Observers

- Reference:

Pierre et al. 2012: Controlling trawler waste discharge to reduce seabird mortality. *Fisheries Research* 131 – 133: 30 – 38.

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