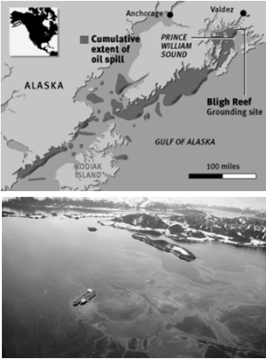


## Oil, Seabirds, and Science

The effects of the Exxon Valdez oil spill


- 24 March 1989
- 10 million gallons
- Largest spill in U.S. history (at the time)
- Oil traveled 900 km and covered 2100 km shoreline



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## Effects of the spill

- 30,000 dead birds retrieved, 74% murres
- First estimate (USFWS), 60%-70% killed based on carcasses
- Wiens/Boersma (1995/96), conclude effects immediately after but diminished rapidly (using counts at colonies)




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## Oil, Seabirds, and Science

The effects of the Exxon Valdez oil spill

John A. Wiens

When the supertanker Exxon Valdez ran aground on Bligh Reef in Prince William Sound, Alaska, on the morning of 24 March 1989, it spilled an estimated 10.9 million gallons of oil into the Gulf of Alaska. Within hours, the spill had reached the Bligh Reef Grounding site, and the oil had begun to travel northward along the coast of Alaska. The spill had a profound impact on the environment, and the effects were felt throughout the Gulf of Alaska. The spill was the largest oil spill in U.S. history at the time, and it had a devastating impact on the environment. The spill was caused by a combination of factors, including human error and a lack of adequate safety measures. The spill was a major environmental disaster, and it had a profound impact on the environment. The spill was the largest oil spill in U.S. history at the time, and it had a devastating impact on the environment. The spill was caused by a combination of factors, including human error and a lack of adequate safety measures. The spill was a major environmental disaster, and it had a profound impact on the environment.



1996 BioScience 46: 587-596

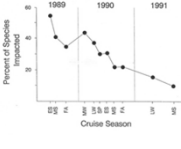

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## The “advocacy trap”

- Insufficient prespill data
- Boersma 1995:
  - Lower murre nesting success in 1990-91
  - Higher nesting success in 93-94
- USFWS
  - Low colony attendance
  - Poor reproduction
- Differences
  - Methods?
  - Interpretations?

### The “advocacy trap”

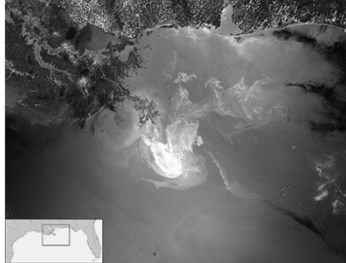
- Counts indicate that populations recover quickly
  - Are northern seabirds “resilient”?
  - Have floaters moved in?
  - Debate over long term effects continues.
  - 20-year analysis of Harlequin Duck populations suggested lingering effects through 2013

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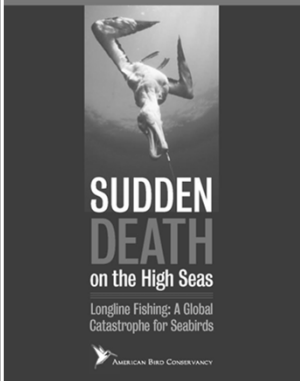
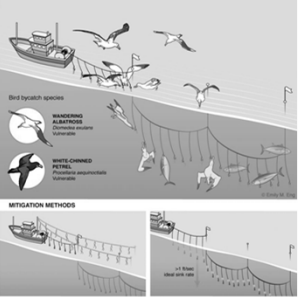
## Deepwater Horizon spill

- 20 April -15 July 2010
- 210 million gallons
- 68,000 sq miles
- Haney et al. (2014):
  - Estimated 600,000 – 800,000 bird mortalities
- Long term effects unknown
  - Bird mortalities not proportional to Exxon Valdez spill



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## Seabirds and Longlines

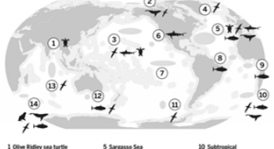



- Identify threat
- Effective action
- Monitor compliance

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## Mobile protected areas for marine birds

**Dynamic habitats on the high seas**  
Protection of species or habitats in such areas may benefit from dynamic area-based management tools or mobile marine protected areas. Areas are identified from the Convention on Biological Diversity's Ecologically or Biologically Significant Marine Areas (www.cbd.int/bsma).



- Marine Protected Areas (MPA)
- Dynamic area-based management tools
- Mobile-MPAs



854 17 JANUARY 2020 • VOL. 547 (8188) 845

Maxwell et al. 2020. Mobile protected areas for biodiversity on the high seas. Science

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## Shorebird conservation

- 31 species migrate from the Arctic to South America
  - Species that breed farther north winter farther south
  - Birds concentrate on stopover and breeding sites so population estimates fairly precise

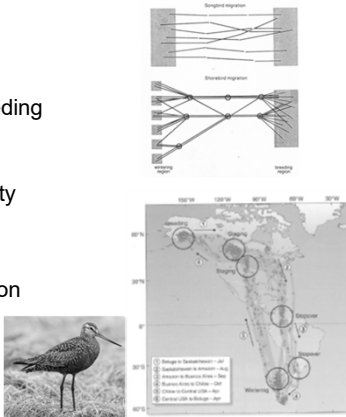



Morrison et al. 2001. Estimates of shorebird populations in North America. Occasional paper #104. Canadian Wildlife service  
Andres et al. 2012. Population estimates of North American shorebirds, 2012. Wader Study Group Bulletin

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## Shorebird conservation

- Life histories
  - Low reproductive rates
  - Single brood, short breeding season
  - K-selected, sensitive to changes in adult mortality
- Stopover sites limited
  - Birds have high energy demands during migration
  - Stopover sites under pressure from humans



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## Western Hemisphere Shorebird Reserve Network (whsrn.org)

- 114 sites (as of April 2022)
- >400 partners across 18 countries
- >38 million acres

Category	Annual Shorebirds	% of species' population	Number
Hemispheric	>500,000	>30%	23
International	>100,000	>10%	29
Regional	>20,000	>1%	58



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