



Collisions of Vessels with Cetaceans: How to mitigate an Issue with many Unknowns

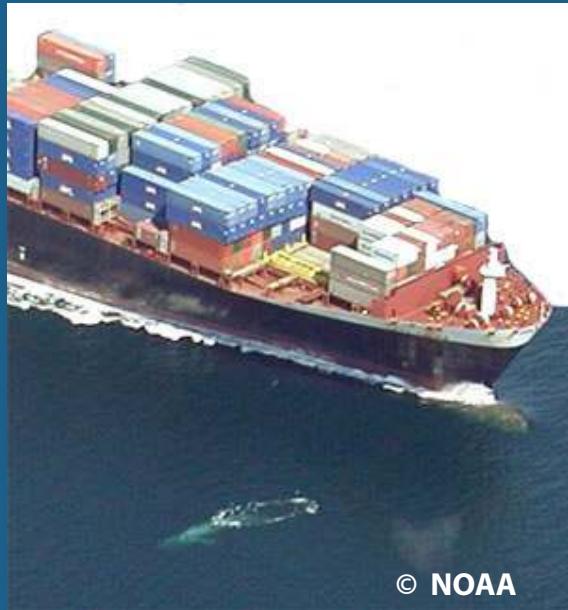


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Event - Location, Country - Date

How do collisions occur?



Introduction > *Reasons & Causes* > *Mitigation Measures* > *IWC Data Base*



Vessel types involved



© Thomas Lesage



Introduction > *Reasons & Causes* > *Mitigation Measures* > *IWC Data Base*



Species involved

Large whales

Small cetaceans



Introduction > *Reasons & Causes* > *Mitigation Measures* > *IWC Data Base*



Why do collisions occur?

BEHAVIOUR OF CETACEANS

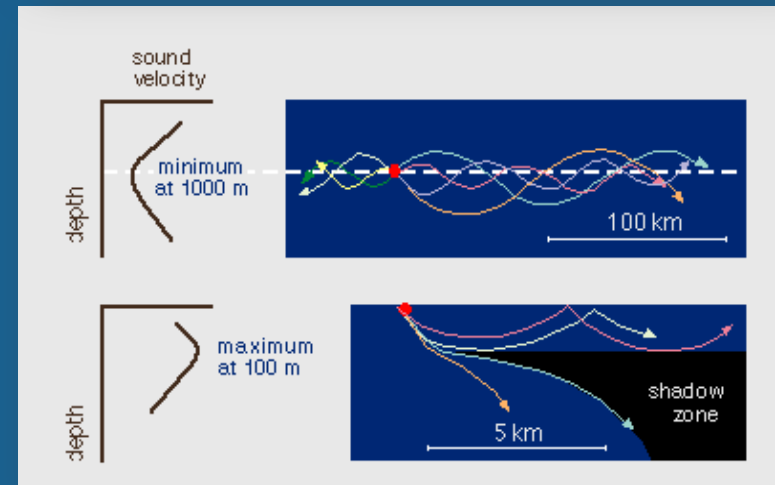
How do whales react? Or: why don't they react?

- Resting/sleeping
- Distraction by other behaviours
- Inter-species differences in responsiveness
- Reaction related to age/sex class or individuals
- Experience and learning
- Background noise, hearing damage (TTS, PTS)



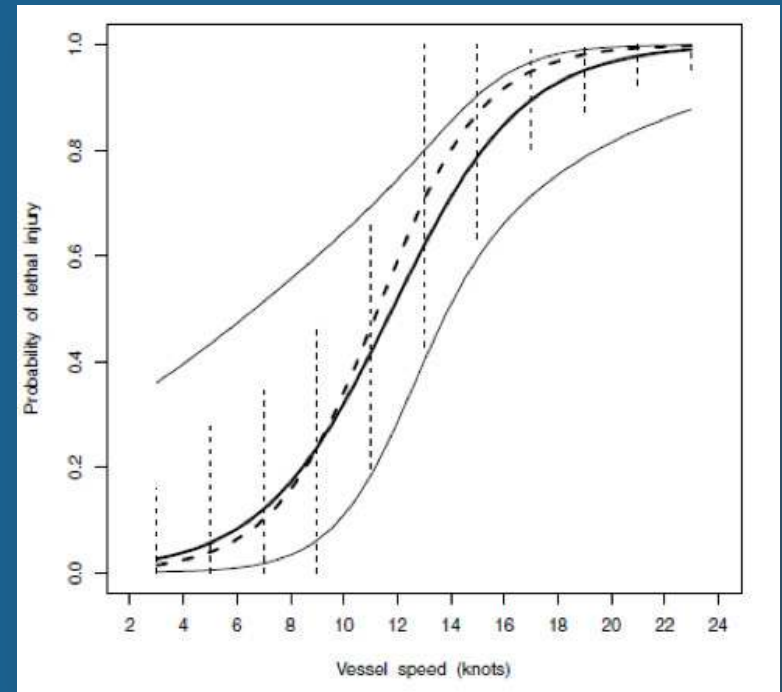
BEHAVIOUR OF SOUND IN WATER

- Refraction, bending, absorption
- Effects of bubbles, sound shadows, sound shielding
- Lloyd Mirror Effect, near field effects
- Cumulative noise from several sources



Speed and size of vessel matter

- The great majority of collisions leading to severe injury or death happened at speeds of 14 knots or more
- Most lethal or serious injuries are caused by large ships (80m length or more)
- 40 knots / whale at 600 m -> max. time for reaction = 30 seconds
- Large vessels might not be able to manoeuvre



from Vanderlaan & Taggart (2007)



- Collisions may go unnoticed
- Injuries may not be identified at sea
- Collisions (purposely) may not be reported
- Animals may drift away and sink
- In stranded animals, collision may not be properly identified



Dark number

???



Photos: Courtesy David Matilla © NOAA



Mitigation: Technological Approaches

Technical mitigation measures

- SONAR
- Acoustic Warning Devices
- Propeller guards, etc.

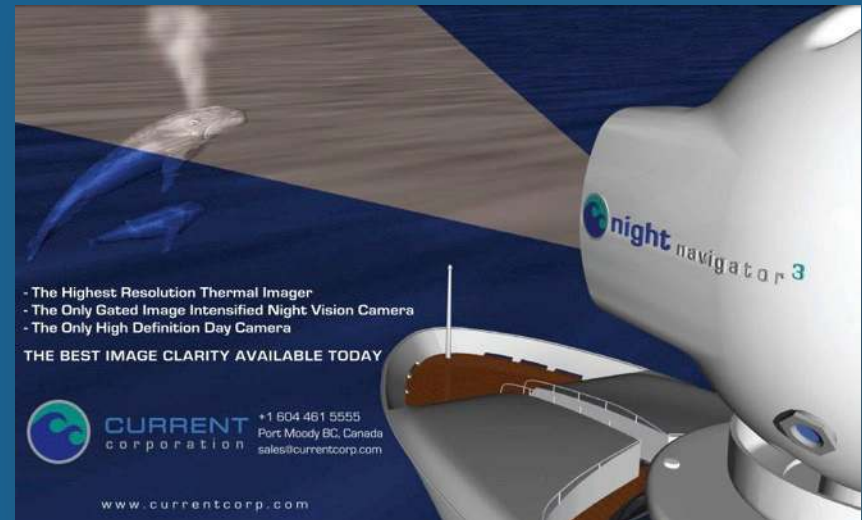
Only short range, additional source of noise

Additional source of noise, effectiveness?

Technical & economic constraints

- Night vision / Infrared systems / Thermal imaging

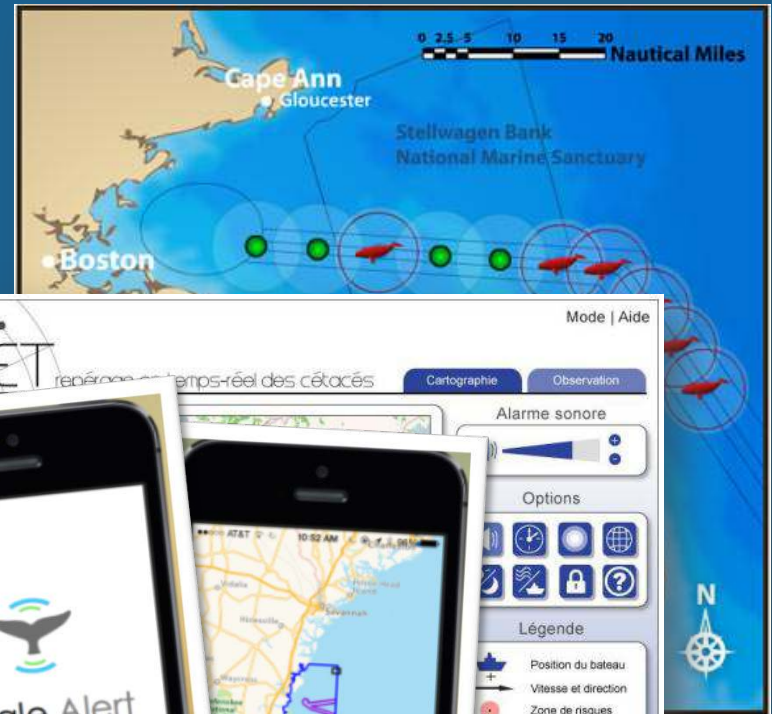
Limited range/effectiveness under adverse conditions



Mitigation: Technological Approaches

Alerting Tools

Passive acoustic monitoring off
Boston (USA)



REPCET
Mediterranean Sea



Whale Alert APP

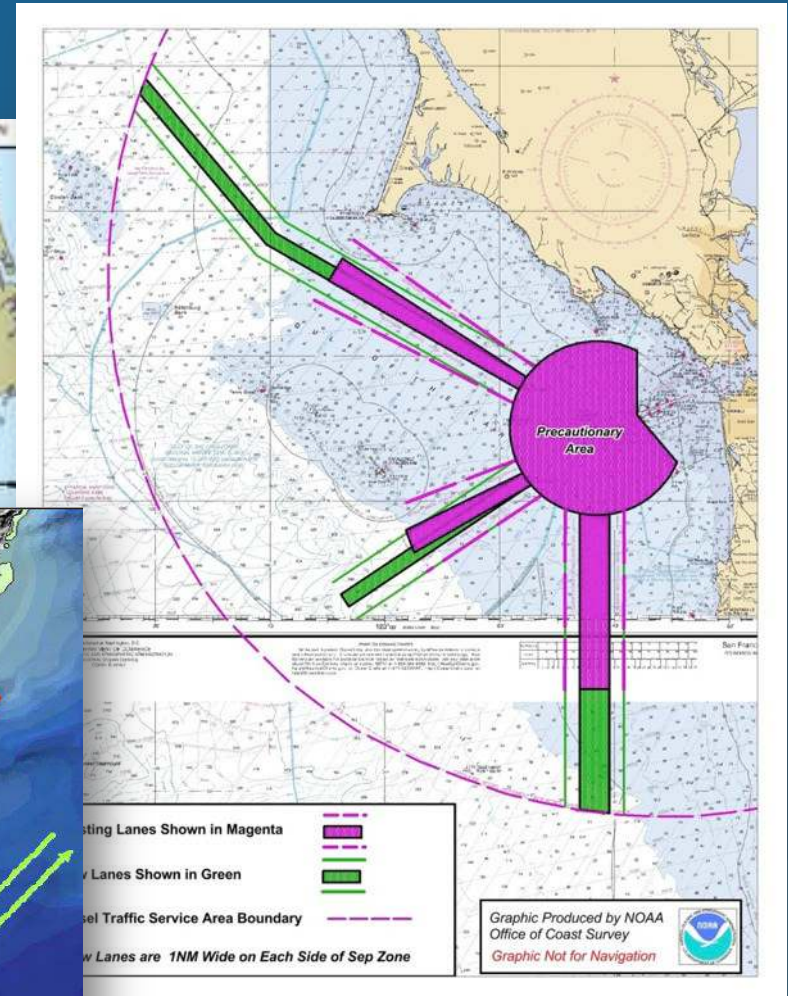
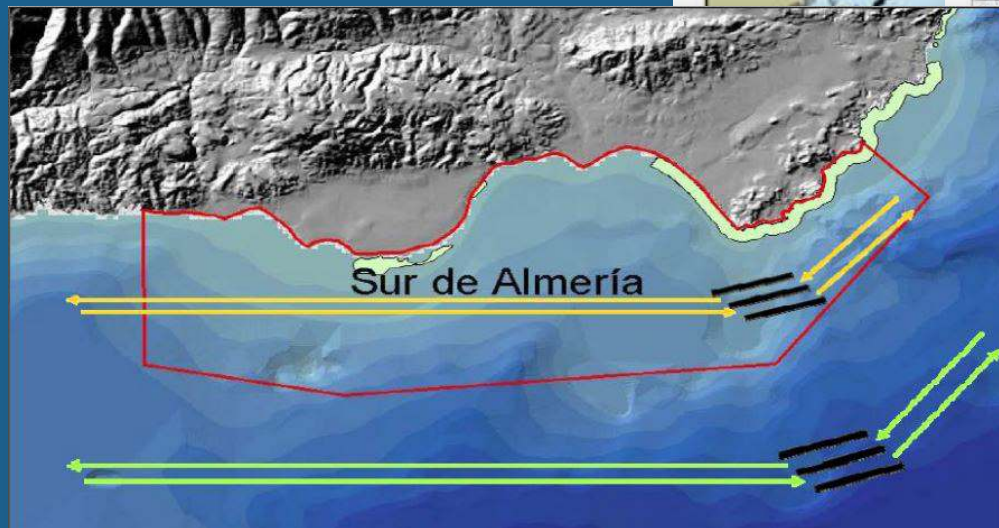
Onboard observers



Operational mitigation measures

Relocation of shipping lanes /
Traffic Separation Schemes

(IMO designation)



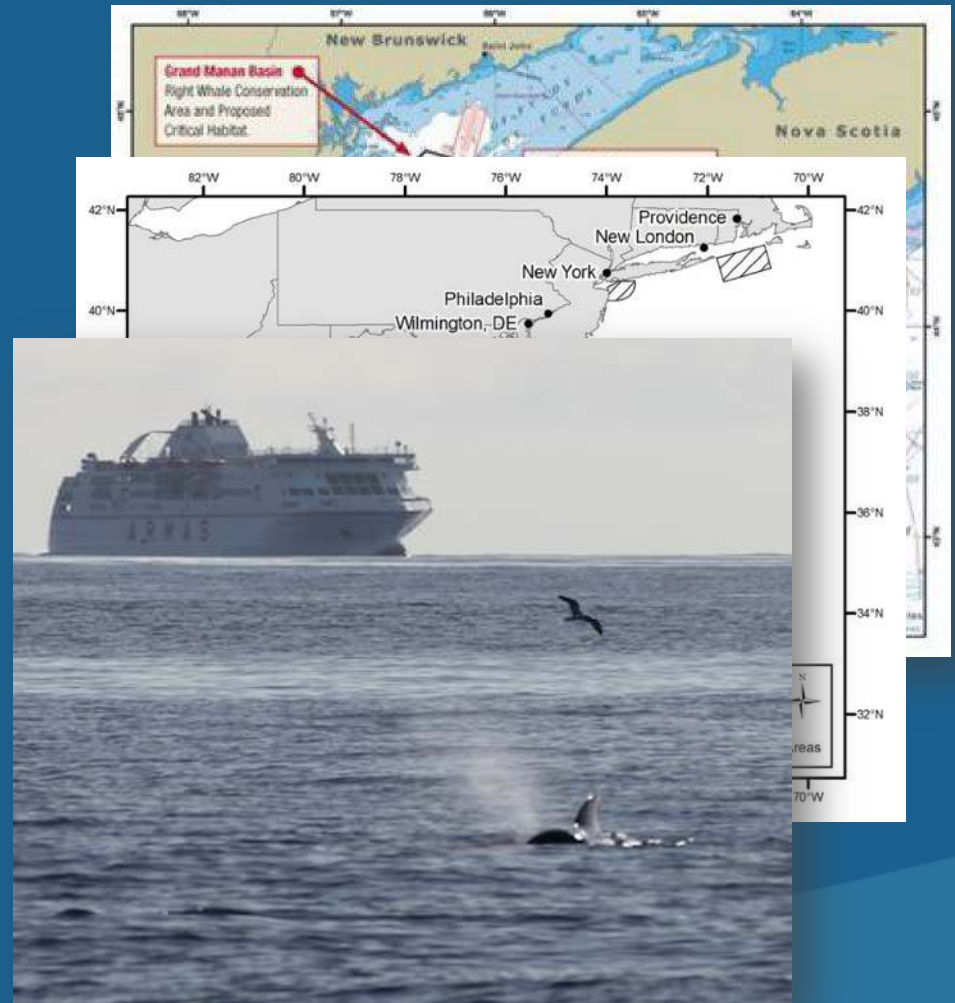
Mitigation: Operational Measures

Areas to be avoided, ATBAs
(IMO designation)

Recommended / mandatory
speed reductions
(e.g. Strait of Gibraltar, Alaska,
East coast US)

Mandatory reporting

Avoidance manoeuvres (?)



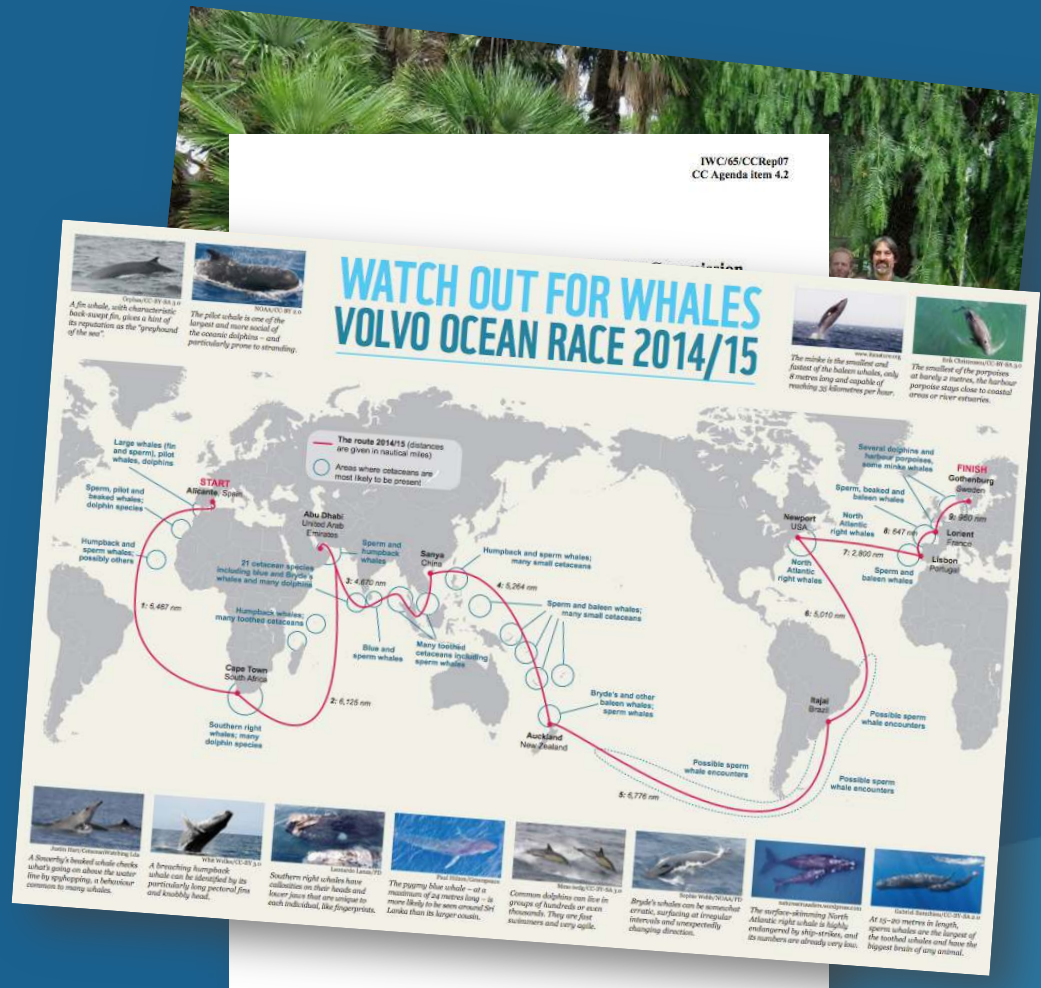
Mitigation: Educational Measures

- Training & education resources
- Courses, curricula
- Websites / Brochures / Signposts, et al.



The Role of IWC

- Ship Strike Working Group
- Scientific Committee
- International Workshops:
 - 2010 – Beaulieu sur Mer (F)
 - 2014 – Panama
- Regular reports
- Guidance documents
- Collaborations



Reporting Collisions : The IWC Global Data Base

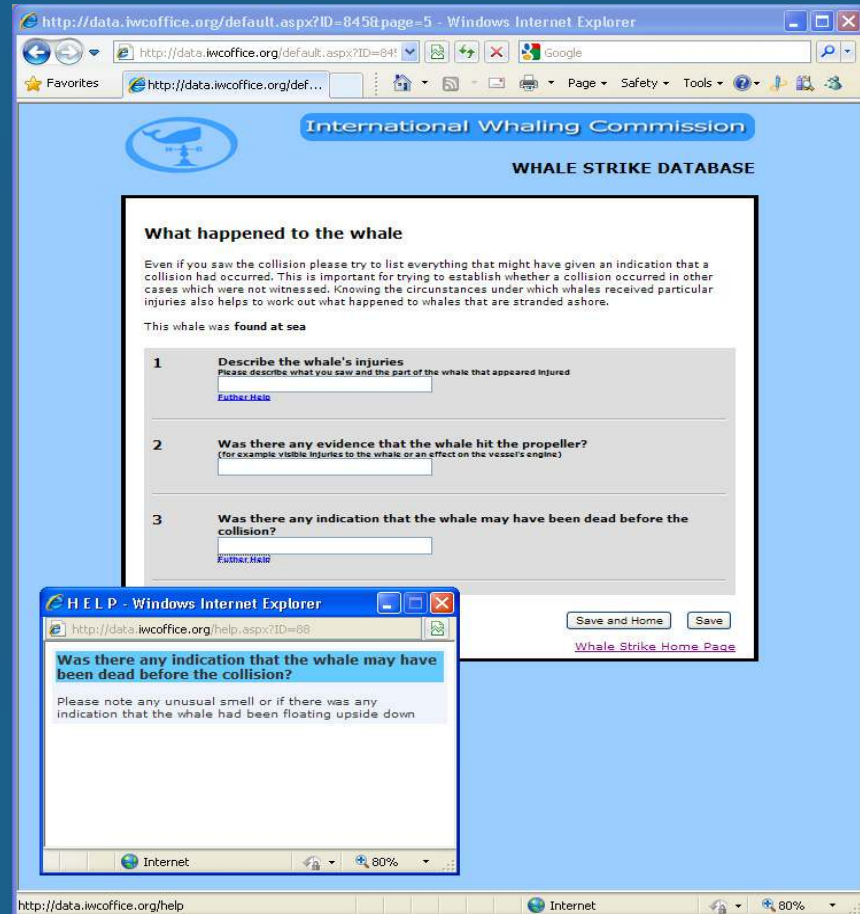
Reporting is essential!

IWC global ship strike data base



Approx. 1,200 incidents

Summary available as download



<http://iwc.int/ship-strikes>



Introduction > Reasons & Causes > Mitigation Measures > IWC Data Base



Recommendations

- ✓ **Separate vessels from whales**
- ✓ **Reduce speed in whale areas**
- ✓ **Place on-board observers**
- ✓ **Train crew & personnel, inform yourself**
- ✓ **Report to IWC data base: <http://iwc.int/ship-strikes>**





SLOW DOWN !!!



Thank You! Merci! Gracias! Grazie! Dankeschön!