



Do Harbour Porpoises (*Phocoena phocoena*) migrate through the Oosterschelde (Easter Scheldt) storm surge barrier in The Netherlands ?



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Introduction

This study comprises data collection by static acoustic monitoring devices (C-POD's) from January 2010 until June 2011. It presents the first systematic acoustic research results, providing a unique data set of migration patterns of Harbour Porpoises from the southern North sea to the Easter Scheldt (Oosterschelde).



The Harbour Porpoises listed under "Least Concern" in 2010 edition of the global IUCN Red List of Threatened species.

Study area

The Oosterschelde is a large estuary situated in the south-western part of the Netherlands. Its water surface comprises about 200,000 ha and it has connection with the North Sea via large openings of the storm surge barrier.



Methods

•Regarding migration, three C-pods were attached to buoys of the safety lines and deployed on the both sides of the storm surge barrier in 2010. The data of the C-pods gave information about the presence of harbour porpoises on both sides of the storm surge throughout the year.

•Migration was assumed to occur when the porpoise clicks were recorded in the Oosterschelde and in the next time interval in the North Sea or vice versa.

Migration		North Sea	Oosterschelde
North Sea to Oosterschelde (in)	10 min time-interval 1	1	0
	10 min time-interval 2	0	1
Oosterschelde to North Sea (out)	10 min time-interval 1	0	1
	10 min time-interval 2	1	0

•The effect of the tide on the presence of porpoises was tested for all datasets. For the influence of the tide the water levels of the locations *Roompot binnen* (within the Oosterschelde) and *Roompot buiten* (outside the Oosterschelde) were compared. The difference in water level was classified into classes.

It has been tested whether a significant difference between the classes could be found in the number of clicks per ten minute time interval, in the detection positive minute per ten minutes time interval and in the presence of porpoises.

Results/ Conclusion

•This study shows that the clicks of the porpoises in the Southern North Sea are most abundant in winter and early spring suggesting that also the porpoises are more present. Porpoises are hardly observed in summer, though returning again in September, suggesting they leave the area in late spring. However, in the Oosterschelde the presence of porpoises has been recorded in all months.

•Migration between the North Sea and the Oosterschelde has been detected. In March 2010, migration from the North Sea to the Oosterschelde was observed 10 times and in October 2010 migration from the Oosterschelde to the North Sea 5 times. In March 2011 there is also a migration peak of 12 times from the North Sea and 10 times from the Oosterschelde.

•In the Oosterschelde, the tidal currents of the storm surge barrier do have a significant effect on the behaviour of the animals: the stronger the currents, the more active harbour porpoises are.

