Practical G 8) Harbour porpoise biosonar

Tutors: Magnus Wahlberg. **Duration:** 5 hrs.

Introduction

In this practical we record and analyse biosonar signals obtained from the captive harbour porpoises at Fjord&Bælt center. The recordings are made with a linear 3-hydrophone array while the animals are swimming towards a fish thrown into the water. Hopefully one of the trials will be made with a blindfolded harbour porpoise to illustrate its ability to find prey only relying on sound.

The Fjord&Bælt center is a combined research and tourist facility. The prey capture trial will be made during a public exhibition, so besides us there will be a lot of tourists around. **We ask you to show great patience with the tourists.** Some of you will be down on the pontoons very close to the animals helping out with the experiment. **It is very important not to drop ANYTHING into the water, to 'behave neutral'** (NOT in the Swedish sense): **this means not paying attention to any interest shown by the animals, e.g. NOT to give them signs, pat them or interact with them in any way.** Also, in general **it is very important that you listen carefully and follow all instructions given to you by the trainers**.

The recordings with the hydrophone array are relayed to the bioacoustic office in the SDU building, where they are sampled and stored on a computer. Draw a sketch of the recording setup here:

Each group will first have a look at the signals using some sound analysis software. What is the frequency content and duration of the signals? How do they differ from 'standard' toothed whale echolocation signals from e.g. bottlenosed dolphins? Why do you think they differ?

Then each group choose a nice click recorded on all hydrophones and measure the time-of-arrival differences to the various receivers. The time differences are used to localize the animal in relation to the receivers, and to measure the source level (the sound intensity one meter from the animal). How to do this will be covered by Magnus in his introduction to the practical. How does the source level differ from the one found in other toothed whales? Why?

Prior to this practical, please read the distributed manuscript by Madsen & Wahlberg: Recording and quantification of ultrasonic echolocation clicks from free-ranging toothed whales.