

## **Hector's Dolphin Database for a South Island Bay: a new tool for the research toolbox?**

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### **ABSTRACT**

Hector's dolphins are an endemic species found along coasts in both the North and South Islands in New Zealand. They are primarily observed along the coast within 5 nautical miles (nm) of the shore. Surveys conducted during the past 5 years have calculated the South Island abundance to be 7,268 (Dawson, Slooten, DuFresne et al. 2004; Slooten, Dawson & Rayment 2004). Hector's dolphins live to be about 20 years old and reproduction begins between 7-9 years. The greatest threat to the continued existence of Hector's dolphins is fishing pressure with set-netting being the technique that causes the greatest harm. Hector's dolphins have been well-studied for the past 20 years and there are more than 140 annotated references (Martinez & Slooten 2003) concerning this animal. Research in the South Island has been concentrated along extensive portions of both east and west coasts while few research projects have been conducted along the south coast.

For the project introduced today, we are using a large geographic scale to allow fine scale spatial and temporal analysis of the Hector's dolphins that utilize the bay. The study site for the project reported on is situated on the south coast of the South Island, at Te Waewae Bay, ~ 50km west of Invercargill. While study sites such as Banks Peninsula cover large geographic areas, Te Waewae Bay is a small geographic area of approximately 220km<sup>2</sup> with a population between 75 and 300 Hector's dolphins. Results from the first year of field work are being organized into a relational Filemaker Pro7 database which is a first for data compilation for this species.

Because Hector's dolphins are found most commonly along coastal margins transects are fixed at the coast itself (i.e. as close to the shore as is safe to approach usually less than 0.5 nautical miles (nm)), and following the contour of the shore, at 1, 3, and 5nm from shore. For this study, photographs are taken of naturally occurring marks on the dorsal fin and body of the observed Hector's dolphins using a Nikon D70 digital SLR camera with a Nikkor AF 80-200mm lens. Photos are downloaded to a laptop computer at the end of each day. Spatial data is captured via an onboard HP Palmtop computer directly connected to a Garmin GPS unit. Track points are downloaded every 2 minutes from the GPS to the Palmtop computer. At each encounter with Hector's dolphins both the start and stop latitude and longitude are recorded as well as the start and stop times of the encounter. All spatial data is also downloaded at the end of each field day to a

laptop computer. Due to the fact the digital camera allows the operator to collect a high number of good quality photos and there is spatial data that is linked to every photo, we propose using the database to analyze the movements of individual Hector's dolphins and groups of Hector's across a broad range of temporal scales as well as spatial scales.

Preliminary distribution results of the density of dolphins observed per kilometre of effort show that the trend for the first year is a higher density of Hector's dolphins during summer than during winter. Maps of the distribution show that the greatest number of dolphins is observed in Te Wae Wae Bay within 1nm of shore. The development and future relationships between tables comprising the database will be presented. Looking beyond the information presented here, the next goal will be to begin quantifying the spatial and temporal relationships of Hector's dolphins at Te Waewae using geographically weighted regression (GWR) allowing as Fotheringham (1997) states "the focus of attention to be on identifying and understanding differences across space rather than similarities."

**Keywords and phrases:** spatiotemporal, analysis, scale; Hector's dolphin,

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