

CASE STUDY: MARINE ANIMAL TRACKING & TELEMETRY

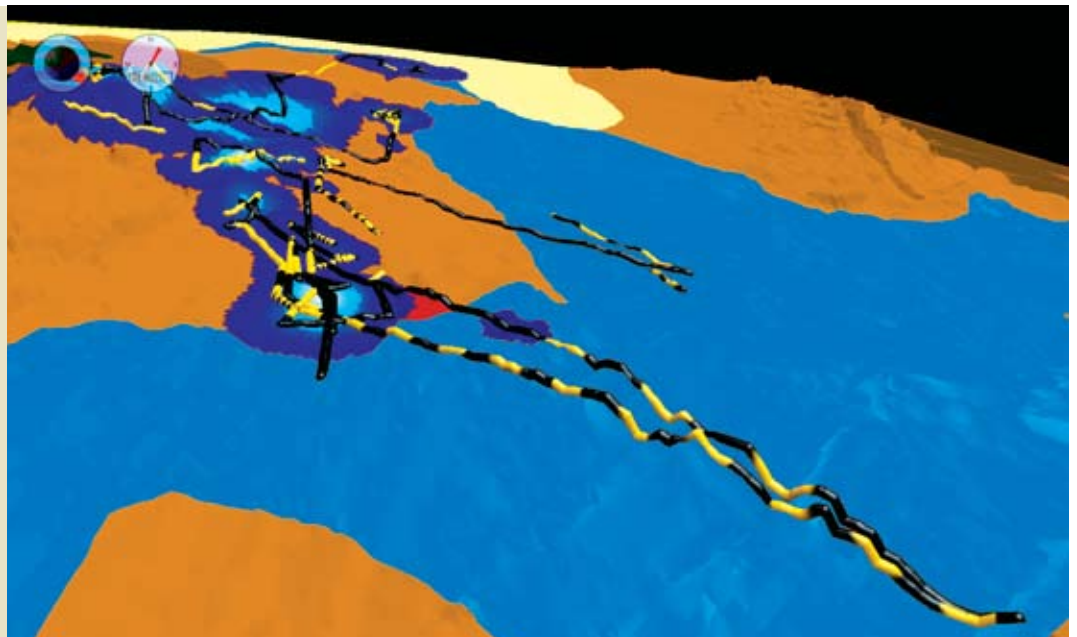
Application: Tracking of Rock Lobsters

Customer: Tasmanian Aquaculture & Fisheries Institute (TAFI),
University of Tasmania

Key Results: Using Eonfusion, researchers at TAFI

- Reduced data processing and integration time by more than 95%
- Eliminated all data processing errors

Using Eonfusion, lobster tracking data is color-coded for day and night (yellow and black, respectively) and overlaid on top of bathymetry and habitat data to create a unique 4D picture of rock lobster behavior.



Project Description

Beginning in 2006, Dr. Hugh Pederson of the Tasmanian Aquaculture and Fisheries Institute (TAFI), University of Tasmania, embarked on a study to address frequent anecdotal reports that fishing activity had altered the behavior of rock lobster stocks in eastern Tasmania. His research sought to examine differences in the movement, behavior and habitat utilization of rock lobsters exposed to fishing activity and those protected inside a Marine Protected Area (MPA). Through the use of the MPA, Dr. Pederson also hoped to examine the behavior of large rock lobsters

that were effectively absent in the adjacent fishery to reveal the likely behavior of stocks prior to the commencement of the fishery.

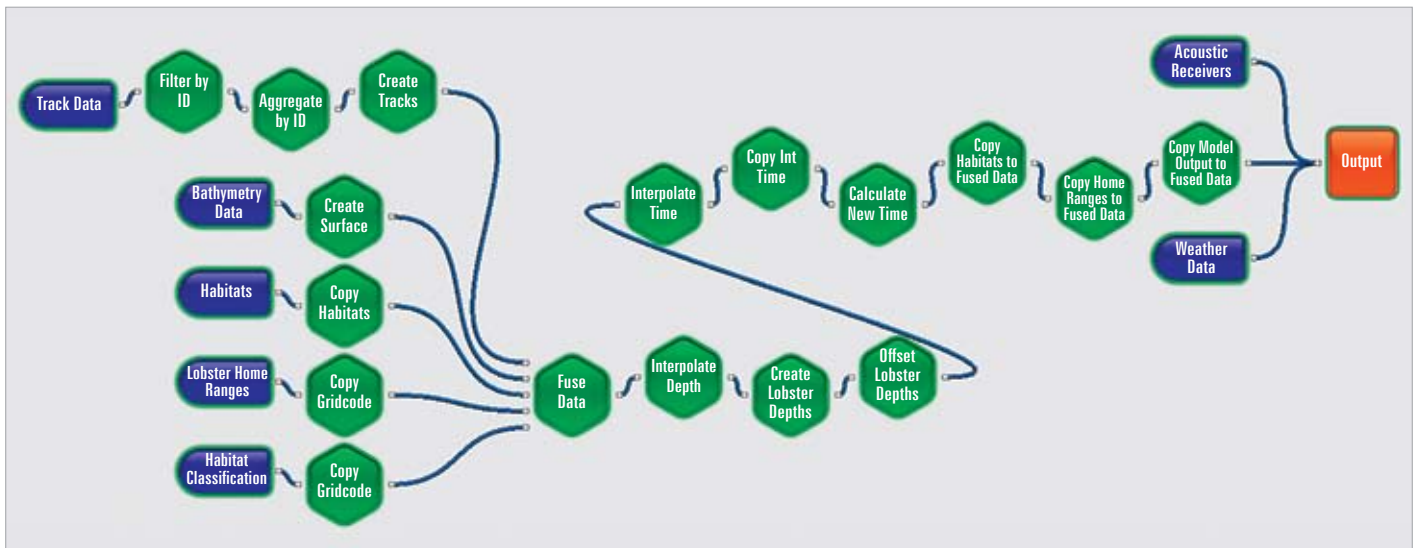
In order to test his hypotheses, Dr. Pederson tagged over 180 lobsters with acoustic transmitters and monitored their movements using a Vemco Radio Acoustic Positioning (VRAP) system and a series of 18 Vemco VR2 receivers. Over the course of 18 months of study more than 3 million detections were recorded. In a separate study, an additional 600,000 detections were collected over an 8 week period.

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The Challenge

The greatest challenge in this project was to figure out how to synchronize, correlate and analyze tracking data from the different acoustic receivers. Initially, a traditional approach was adopted utilizing manual data processing methods and a traditional GIS system. Working on an isolated portion of the study, Dr. Pederson spent several days processing the data from the VRAP and VR2 receivers for just two transmitters. However, with 42 transmitters in the data set, he quickly realized that the traditional data

processing approach was inadequate. He estimated that the data processing time for the entire study would be in excess of 600 hours (3 ½ months!) and predicted that the resulting data would most likely contain a high error rate. In addition, this methodology would make it very difficult to incorporate the meteorological, habitat classification and bathymetric data which were required for a full picture of the rock lobster's behavior.



Results

Recognizing that the traditional approach would take too much time and effort, Dr. Pederson turned to Eonfusion. Using a new data flow that he developed for the application (shown above), he was able to process the data for all 42 transmitters, without error, in just 10 hours. Eonfusion also allowed him to easily incorporate meteorological, habitat classification and bathymetric data into his model resulting in a truly unique 4D picture of rock lobster behavior and habitat utilization. This revealed previously unseen patterns and correlations, extracting even greater value from the data which he worked long and hard to collect.

Using the Eonfusion dataflow shown above, more than 3.6 million tracking records were processed and integrated with bathymetric, weather and habitat data to study rock lobster movement patterns. Data inputs are shown in blue; data processing steps (also known as operators) are shown in green; the resulting 4D visualization output is shown schematically by the orange block at right.

Additional Information

For additional information on Eonfusion or to review other case studies, please visit the Eonfusion website at eonfusion.myriax.com or email us at info@eonfusion.myriax.com

If you would like information specific to the research highlighted in this case study, please contact Dr. Pederson at TAFI at: Hugh.Pederson@utas.edu.au.