



Oregon Marine Reserves – Researcher Bio

DR. JESS HOPF

Dr. Jess Hopf is an ecological modeller, which is someone who converts biology and ecology into mathematics to help us better understand the natural world. Jess focuses on species and ecosystems that live in our oceans and rivers and she is especially interested in finding better ways to manage and conserve these environments. For example, Jess builds ecological models that can help managers decide how to design a marine reserve network that may reduce the effects of coral bleaching events on fisheries in the Great Barrier Reef, Australia.



Jess studied marine biology at James Cook University in Australia. During her undergraduate degree she took courses in general biology, chemistry, maths, physical oceanography, marine conservation, marine ecology and, of course, ecological modelling. Although her current work doesn't involve scuba diving, Jess also got her scuba diving ticket and worked for a period as a Dive Master and Tour Guide on the Great Barrier Reef. Scuba diving is a highly beneficial skill to a marine biologist! For her honors year (last year of her undergraduate), Jess did a research project on upside-down jellyfish. She was studying ways to determine their age and discovered that you can tell how old an upside-down jellyfish is by looking at its statoliths (small crystals that help the jellyfish sense gravity). Although interesting, Jess realised that jellyfish aquaculture wasn't really her thing and for her next research project, her PhD, she turned to ecological modelling and marine reserves. For her PhD, Jess used mathematical models to help us better understand how populations of coral trout (a favourite fish in Australian fisheries) can be expected to change after a marine reserves network is put in place and what impacts this will have on local fisheries. She also researched how marine reserves may help reduce the effects of environmental disturbances (coral bleaching, cyclones, and freshwater flooding events) on fish populations and fisheries catch.

Since completing her PhD, Jess has also worked with freshwater systems. She was part of a large multi-disciplinary project looking at using a virus to control carp, which are a major pest fish in Australian rivers and lakes that negatively impact native species. She used very similar skills that she learnt during her university days in this project, but also had to learn

new techniques in freshwater ecology and epidemiology (the study of how viruses spread through populations). Currently, Jess is doing research with Oregon State University. She is back looking at how marine reserves affect fish populations and the implications that this has for fisheries, this time focusing on the Californian and Oregon marine reserve networks. Jess feels the best part of her job as an ecological modeller is building the models (coding), sharing her research through talks and presentations, and seeing her findings make an impact on how our environment is managed.