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Summary

Coastal seascapes represent a mosaic of different habitat types that shape species assemblages. The actual value of the seascape will vary, being often a result of the complexity of the habitat, heterogeneity and connectivity. For marine species, such as coastal fishes, habitat connectivity represents an important factor that can shape the overall temporal and spatial distribution of fish populations. However, specific information about how habitat type and connectivity interact to shape fish populations is still lacking.

Studying coastal seascapes by determining habitat hotspots and its function and the influence of habitat linkages through cross-habitat tracking of fish movements is critical for improving conservation of non-commercial and commercial estuarine fishes. Providing an answer to these variables will be difficult to achieve using traditional methods (seine nets, fyke nets and trawls). With recent advancements in computer vision technology, automatic processing of captured underwater video data has been possible, avoiding expensive and time consuming manual analysis. Previous software developed at the Connolly Laboratory was able to detect and recognize certain fish species, yet, much work is needed to turn this early-method into an automated monitoring tool.

The aim of my PhD study is to identify habitat hotspots and their underlying environmental characteristics by exploring cross-habitat fish movement using novel machine learning methods developed at the Connolly Laboratory (FishID).

Given that fish species are highly abundant and some of them are commercially valuable, exploring and studying fish habitat hotspots and their movement between habitats is critical information for improving the conservation of coastal seascapes. The identification of these hotspots and their underlying variables can shape future conservation policies in Australia and shape investment to the needs of unprotected wetlands. Finally, the enhancement of FishID and its application to answer ecological questions will highlight the importance, function and value of coastal habitats and fish species.

Research Expertise

- Machine learning
- Intertidal ecology
- Coastal seascapes
- Spatial modelling