Developing national on-line services to annotate and analyse underwater imagery in a research cloud

Roger Proctor (1), Tim Langlois (2), Ariell Friedman (3), and Brendan Davey (4)

(1) Australian Ocean Data Network, Integrated Marine Observing System, University of Tasmania, Hobart, Australia (roger.proctor@utas.edu.au), (2) School of Biological Sciences & UWA Oceans Institute, University of Western Australia, Perth, Australia, (3) Greybits Engineering, Sydney, Australia, (4) Tasmanian Partnership for Advanced Computing, University of Tasmania, Hobart, Australia

We present a case study of how national on-line services, developed within a domain-oriented research cloud, are being used to a) annotate habitat images collected using Autonomous Underwater Vehicles (AUVs) and b) synthesise fish annotation data sets from baited remote underwater stereo-video (stereo-BRUV).

Fish image annotation data, is currently collected by various research, management and academic institutions globally (+100,000's hours of deployments) with varying degrees of standardisation and limited formal collaboration or data synthesis.

Two developing software tools have been brought together in the science cloud to provide marine biologists with a powerful service for image annotation. SQUIDLE+ is an online platform designed for exploration, management and annotation of georeferenced images & video data. It provides a flexible annotation framework allowing users to work with their preferred annotation schemes. We have used SQUIDLE+ to sample the habitat composition and complexity of images of the benthos collected using stereo-BRUV. GlobalArchive is designed to be a centralised repository of aquatic ecological survey data with design principles including ease of use, secure user access, flexible data import, and the collection of any sampling and image analysis information. To easily share and synthesise data we have implemented data sharing protocols, including Open Data and synthesis Collaborations, and a spatial map to explore global datasets and filter to create a synthesis.

These tools in the science cloud, together with a virtual desktop analysis suite offering python and R environments offer an unprecedented capability to deliver marine biodiversity information of value to marine managers and scientists alike.