Coral study leads to new partnerships

Jackie Wolstenholme, a research services librarian at James Cook University, wrote her PhD thesis on species boundaries in corals.

After making her work open and accessible, one small table of data led to interest from two professors at the University of Sydney: Emeritus Professor Liam Burke, a physiologist, and Professor Maria Byrne, a marine biologist. Together with Japanese researcher Dr Yoko Nozawa from Academia Sinica, Taiwan, they have teamed up to study new perspectives on the timing of coral spawning. Jackie told *Share* more...

Data on coral habitats led to new research partnerships (Credit: Dr Yoko Nozawa)

What was your original research about, and what was Yoko Nozawa's original research about?

JW: Spawning data has traditionally been collected to study the biology and reproduction of corals. I investigated the fertilization potential of five similar species for my PhD. Yoko has separately examined the influence of temperature on coral reproduction.

So when exactly does mass spawning occur?

JW: That is something that has eluded researchers. We know on which month the corals will spawn for many locations. We also have a good idea about the time of night that corals will spawn, even down to the detail of variation between species. What we can't yet predict is exactly which nights the spawning will occur. We know that mass spawning occurs after the full moon, around the time of the third-quarter moon. Although this knowledge narrows it down to one of several nights in the year, it still means researchers may need to wait night-after-night to make sure they 'catch' the coral spawning.

And why is it useful to know when corals will spawn?

JW: Beyond research, there are also commercial implications. A major drawcard for dive tourism is to swim amongst mass spawning corals. I have also worked for a film crew to capture spectacular footage of mass spawning corals.

Along with Yoko Nozawa, you have now teamed up with Professor Liam Burke and Professor Maria Byrne for new research. Tell us more about the project.

JW: The idea for our current project is Liam and Maria's. Liam has published on the relationship between human vision in eyes affected by macular oedema and the lunar cycle. He found that visual acuity (sharpness) is better at the time of the full moon in the eye with macular oedema. On what seemed to be an annual cycle, Liam also found that a decrease in atmospheric pressure correlates with an increase in visual acuity, both in the oedemetous eye and normal eye. Liam was keen to test his findings in another biological system, and Maria suggested mass spawning corals. To test it, Liam needed data on the timing of spawning by individual coral colonies. Fortuitously, colony data is the level of detail recorded by Yoko and me.

And your previous research is a key part of the new project?

JW: Neither Yoko nor I could have imagined the project that we are now part of when we were collecting our coral spawning data. Yoko's data systematically documented the timing of spawning of four species corals, and was the focus of his paper. In my case, timing of spawning was one of many characters I used to assess the potential for corals to breed. My data is therefore from just one small table in my PhD, and the resulting journal article.

Are any other open datasets being used for the project?

JW: We are using climate data to develop our understanding of the timing of coral spawning. I kept a close eye on the weather while doing my coral spawning field work to determine where we could dive each day but only recorded anecdotal notes. Fortunately, the freely available historic climate data from the Australian Institute of Marine Science (AIMS) has provided the information we need. Without this, our current project would not be possible. Similarly, Yoko has obtained freely available data for our project from the Japan Meteorological Agency.

It sounds like a good advert for open research data.

JW: Yes. Importantly, the coral spawning data collected by myself and Yoko had been managed in a way that enabled it be retrieved. In my case, this was 15 years after the data was collected. Improving the discoverability of coral spawning data could facilitate further projects that, at this point, cannot be imagined by the researchers collecting the data. The climatic data we used are also great examples of how carefully curated data can enable projects that were not anticipated by the data collectors or data custodians.