Coastal & Marine Citizen Science in New Zealand

NZMSS Workshop Proceedings

Shane Orchard & Helen Kettles

7 July, 2016

Summary

A group of 29 participants met for the Coastal & Marine Citizen Science Workshop, on 7 July 2016, straight after the joint New Zealand Marine Sciences Society (NZMSS) and Australian Marine Sciences Association (AMSA) conference in Wellington. This was a first meeting specific to coastal and marine citizen science in New Zealand. A wide range of experience and skills were represented and included people involved in current citizen science projects and scientists with interests in the potential of citizen science to address wider information needs. The energy and enthusiasm of the participants also reflected the high interest in this topic. There were two major workshop topics: preparation of a citizen science projects list for a national estuaries science and management summary, and an exercise to explore gaps and opportunities for citizen science to assist coastal science and management objectives in. Examples from both New Zealand and Australian helped to enrich the conversation and identify priorities for advancing these topics in the short to medium term.

Outcomes of the workshop included: a list of citizen science projects currently underway in coastal and marine environments to add to the national picture of citizen science, identification of opportunities for progressing this area of work in New Zealand, a list of priority actions to undertake in the short-term. Another important outcome was the opportunity for the network of practitioners to make connections and share ideas.

Introduction

Interests in coastal & marine citizen science

To begin with we had a round of introductions with the question "what brings you to this workshop?". This illustrated that there are a lot of different motives for people interested in citizen science. Attendees covered a broad range of projects, skills and experience. They came from councils, central government, universities, research institutes, dive clubs, the tourism industry and community groups (see Appendix 1 for a list of participants).

Terminology

The inevitable question of "what is citizen science?" was discussed. For the purpose of this workshop we kept the scope broad and used the term to stimulate discussion rather than constrain it.

"Citizen science is a broad range of activities where information collected by the community may assist science projects, communication, engagement, and related objectives"

The reasons for citizen science vary (hereafter also referred to as 'CitSci') and there is a wide spectrum of interests for which CitSci can be useful. The remainder of the workshop explored some of these with a focus on coastal and marine.

Workshop Focus

The workshop was designed to stimulate discussion around two contemporary themes:

- preparation of a CitSci projects list for a national estuaries research and management summary; and
- explore gaps and opportunities for CitSci to assist coastal science and management objectives in New Zealand.

To help orient the lively discussion around a clear purpose these were related to the following 'focus question' for the workshop.

Focus Question

What estuarine and coastal citizen science is happening in NZ, where are the opportunities, and how can these be used to achieve various coastal science, engagement and outreach outcomes?

Scene Setting

Citizen science projects listing in the National Estuaries Summary

To help kick off the thinking Helen made a short presentation on the "Our Estuaries" hub and draft listing of CitSci projects in a summary of current estuaries research and management in New Zealand.

The "Our Estuaries" website is based around three interactive maps (restoration, monitoring and experiencing). The monitoring maps showcase monitoring undertaken by New Zealanders as a collective (councils, DOC, iwi, communities).

The "Citizen Science Projects" list in the upcoming national estuaries review is an opportunity to identify the range of projects underway in New Zealand and assist with networking and coordination. This section will make a significant contribution to the overall estuaries review which aims to showcase all research and management underway in New Zealand. Contributors to the review include CRIs, Councils, Universities and along with CitSci mātauranga Māori work is showcased. DOC intended to keep this review current every one or two years.

See Appendix 2 for "Our Estuaries" info and Appendix 3 for an initial list of Citizen Science Projects for the National Estuaries Summary.

Role of NatureWatch NZ in supporting citizen science

Shane made a short presentation on where NatureWatch NZ (NWNZ) fits in. NWNZ is not a project itself but is a national platform for supporting CitSci in New Zealand. It provides free data storage and data collection functions. All of this is in the 'cloud' so projects using NWNZ can access all of the functions from any computer or using mobile apps in the field. There are also other examples of IT tools designed to support on-the-ground CitSci projects (for example, several software systems for collecting pest trapping data). In relation to these, NWNZ aims to collect all biological data (anything to do with species) in one place. Data that is initially collected into another

system (e.g. it could be a spreadsheet on your computer!) can easily be added to NWNZ at any time using its bulk upload functions.

The national scope of NWNZ and ability for users to customise exactly what they want to use it for are some of the key features. A nice offshoot of using NWNZ as a platform for a local project is that it supports the same data being used to assist other projects and purposes, though you always have the option of keeping your records totally private if you'd like to. In this way NWNZ helps CitSci at several different levels by bringing together community knowledge on NZ species where it is discoverable and potentially usable for many different purposes (e.g. monitoring) at lots of different scales (e.g. local to national).

See Appendix 4 for a list of some the main features NWNZ offers to support CitSci projects on the ground.

Citizen Science gaps and opportunities for coastal & marine

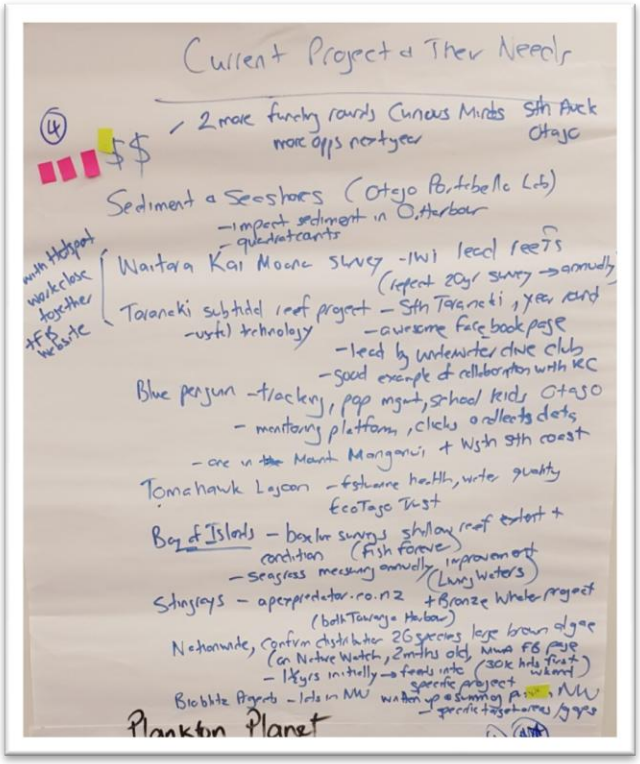
World café was used to generate ideas around three topics:

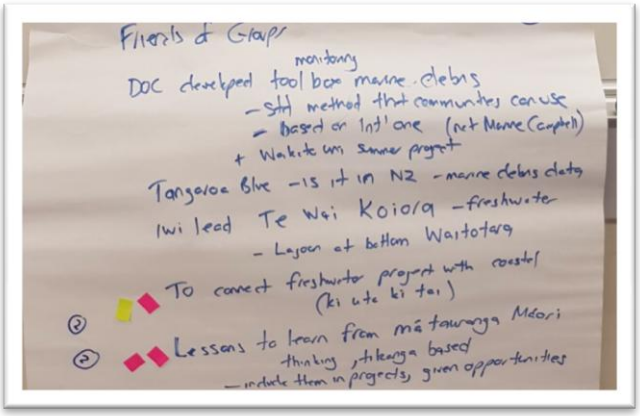
- Current projects and their needs
- IT tools to support CitSci projects
- Opportunities and challenges for progressing coastal CitSci in New Zealand

Each café session was followed by a round of report-backs to the whole group.

Current projects and their needs

To kick off this café a range of current projects were discussed and are listed here for future reference:





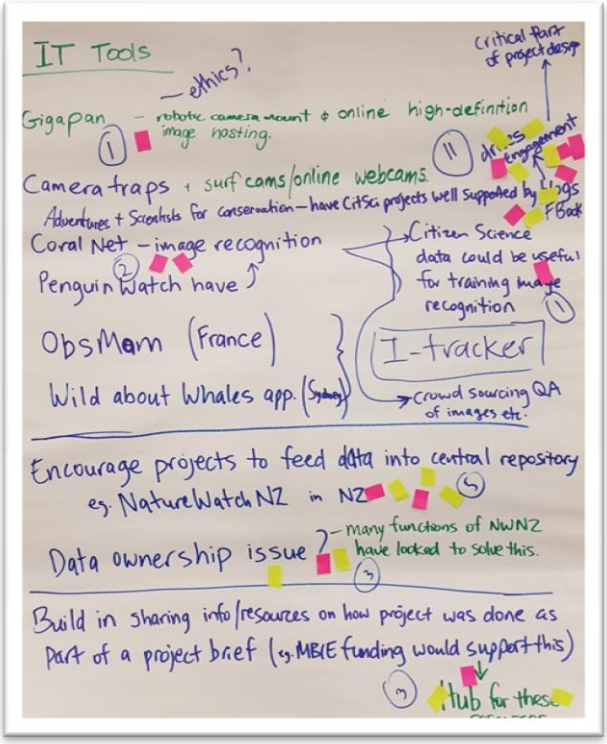
- Otago Portabello Lab sediment and seashores – impact of sediment on Otago harbour, quadrat counts.
- Waitara kai moana reef survey – iwi lead (repeating annually a survey undertaken 20 years ago).
- South Taranaki subtidal reef project – useful technology, awesome Facebook page, led by Underwater Dive Club, good example of collaboration with regional council.
- Various blue penguin
    - Otago – population management, monitoring clicks at platform school kids
    - Mount Manganui and Wellington South Coast – other programmes
- Ecotago Trust Tomahawk Lagoon – estuarine health, water quality
- Fish Forever Bay of Islands – baseline surveys of shallow reef extent and condition
- Living Water Bay of Islands seagrass - measured annually.
- Tauranga Harbour stingray and bronze whaler projects– website www.apexpredator.co.nz
- NIWA nationwide large brown algae – to confirm distribution of 26 species, NatureWatch NZ, 2mths old, Facebook page, will run for 1.5 year initially and feeds into specific science project, targeting specific areas and gaps, 30k hits in first weekend, will write up summary of results for NatureWatch NZ.
- Bioblitz projects – several examples in NatureWatch NZ.
- Plankton Planet.
- Friends of Groups
- DOC marine debris - toolbox for monitoring with standard method communities can use, based on international one.
- Waikato Uni marine debris – summer project.
- Te Wai Koiora – iwi lead freshwater lagoon at Waitara.

The discussion of needs focussed around networking, potential commonalities and overlaps between projects, communication aspects, generating lasting support through strategies such as ‘Friends of’ groups, and inclusion of mātauranga Māori.

IT tools to support CitSci projects

Some of the IT tools discussed were

- Gigapan panoramic camera
- Camera traps
- Image recognition software used to automate data capture from images
- Project functionality in NatureWatch NZ
- I-tracker
- Various apps to assist field data capture



Some of the IT opportunities discussed were

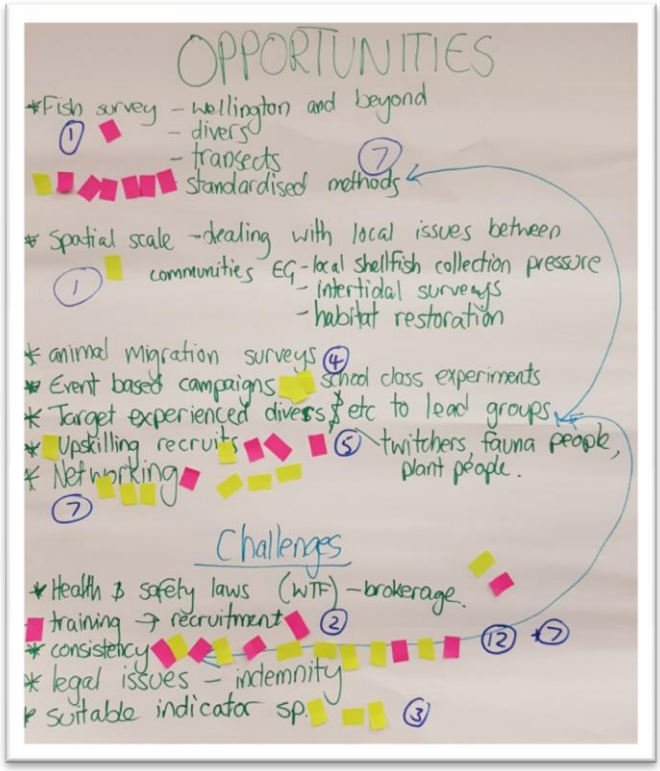
- ways to bring together data eg. feed into a common repository like NatureWatch NZ rather than sitting in individual servers
- ways to promote 2-way data exchange / availability to end users
- data visualisation
- having info on how IT solutions were created documented as part of CitSci project briefs
- potential for an info sharing hub where IT, technical and resource materials could be shared eg. hosted on the MBIE Participatory Science Platform.

Opportunities and challenges for progressing coastal CitSci in New Zealand

Opportunities identified:

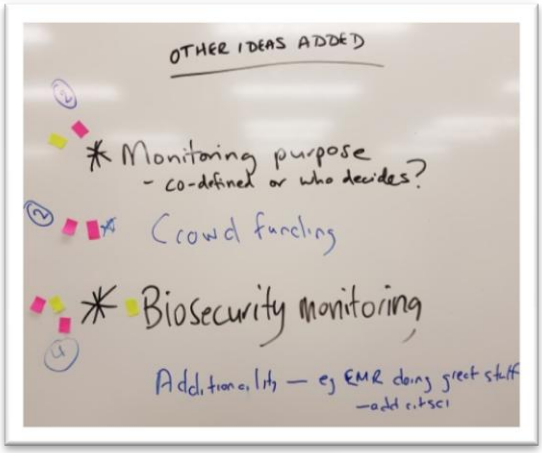
Some of the IT opportunities discussed included specific ideas for new projects. Having an Australian contingent present added greatly to the scope of discussions and several ideas were generated around examples of CitSci projects in Australia (and elsewhere in the world) that could be extended to New Zealand or might provide useful templates for similar needs. Examples include the projects using Gigapan and I-Tracker.

Ways to assist existing projects was another area of opportunity. Ideas generated included making connections between some of the current needs and some of the tools and solutions discussed at the workshop.



Challenges identified included:

- addressing potential health and safety and liability issues for field based projects
- promoting consistency in data collection
- promoting the coordination of efforts, for example to focus the CitSci effort on target/indicator species for which information is lacking and would be especially useful
- providing sufficient support for training, recruitment, and succession planning for projects on the ground

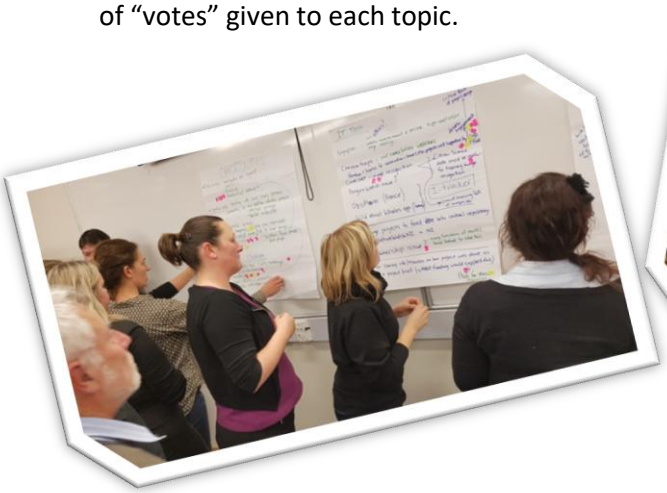


Priorities for progressing coastal CitSci in NZ

Based on the ideas generated from all three World Café tables, each person was asked to identify the top four ideas for progressing coastal CitSci in New Zealand from their point of view.

This prompted the group to review all of the points that had come out of the World Café discussions and some new important points were identified in response to this. These were added to the whiteboard and were eligible for the top four "voting" round using the sticky dot technique. There was also some similar points recorded that were lumped together during the review exercise to assist with the voting strategies!

The results are listed below for all topics that scored one or more votes. Topics are described using as close as possible to the original notes taken in World Cafe. Numbers in brackets are the number of "votes" given to each topic.



Priority topics and opportunities for progressing coastal CitSci in New Zealand

- Consistency and standardising methods (19)
- Engagement – Facebook, Blogs critical part of project design (11)
- Networking (7)
- Encourage projects to feed data into central repository e.g. NatureWatch NZ (5)
- Twitchers, fauna people, plant people (5)
- Biosecurity monitoring (4)
- Animal migration surveys (4)
- Curious Minds two more funding rounds - opportunities next year in South Auckland and Otago (4)
- Build a hub for shared info/resources on how projects were done as part of a project brief (e.g. MBIE funding would support this) (3)
- Data ownership issue – several functionalities of NWNZ have looked to solve this (3).
- Suitable indicator species (3)
- Image recognition – Coral Watch, Penguin Watch. Crowd sourcing QA of images, citizen science could be useful for training image recognition (3)
- Monitoring purpose – co-defined or who decides (2)
- Crowd funding opportunities(2)
- Training and project support (2)
- Health and Safety laws – brokerage (2)
- Connect freshwater projects with coastal (ki uta ki tai) (2)
- Lesson to learn from mātauranga Māori thinking, tikanga based, include iwi in projects, give opportunities (2)
- Fish survey – Wellington and beyond, divers, transects, standard methods
- Spatial scale – dealing with local issue between communities e.g. local shellfish collection pressure, intertidal surveys, habitat restoration.
- Upskilling recruits
- Gigapan – robotic camera mount and online high-definition image hosting, ethics?
- Event based campaigns
- School class experiments
- Target experienced divers etc. to lead groups
- Legal issues – indemnity
- Additionality – e.g. EMR doing great stuff, add citizen science
- Camera traps and surf cams/online webcams
- Adventures and science for conservation – have citizen science projects well supported by Blogs and Facebook
- OBS MAM in France and Wild About Whales app in Sydney
- Use of drones
- I-Tracker Australian http://www.cybertracker.org/uses/indigenous-knowledge/255-i-tracker-australia

Top 5 actions for progressing CitSci in the next 12 months

In the last stage of the workshop we short-listed ideas for a "Top 5 Actions" to take for progressing coastal CitSci in the next 12 months. Here's what was recorded on the whiteboard:

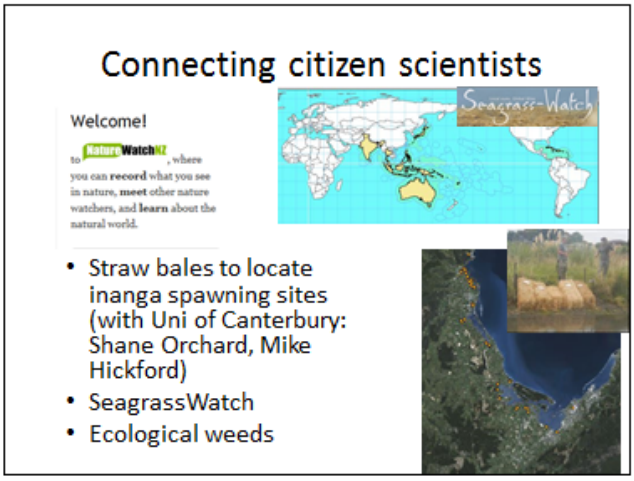
1. Create a platform to connect people
    - Curious Minds might do this
    - People can submit ideas, requests for support
    - Support functions for CitSci are needed (e.g. training, project support) for people getting projects set up using the currently available tools (e.g. NatureWatch)
2. Face to face gatherings
    a. Citizen Science in the pub - gathering with food. Trial this in some centres.
    b. Follow workshop to progress the discussion needed within 6 months, e.g. retreat style wānanga.
3. Health & Safety Guidelines – needed earlier rather than later.
4. Development of standardised methods for data collections / monitoring
    a. Consistent, what are the standard methods?
    b. Could Crowdsource to do?
    c. People are spearheading certain things e.g. Nicole (ProjectBaseline) interested in diving and snorkelling, Shane has a pilot project developing examples using penguin monitoring.
5. Explore who owns the data
    a. Quality Assurance work, custodians of data.
    b. How to reference it, availability of data/central repository.

Note: 3, 4 and 5 needs a coordination entity (and regular wānanga) to progress.

Appendix 1: Workshop participants

Name	Organisation	Some interest areas
Sheryl Miller	GWRC	Porirua Whaitua
Claire Conwell	GWRC	Ecotoxicology
Megan Oliver	GWRC	Scientist, Porirua Harbour project
Rich Ford	MPI	Scientist, robust data, funding, agency gaps
Pamela Mace	MPI	Scientist, robust data, fisheries in local area
Dana Clark	Cawthron Institute	Scientist, impacts of human activities on the marine environment, particularly estuaries.
Julie Hall	NIWA, Director Sustainable Seas	National Science Challenges
Juliet Milne	NIWA	work and personal, developing priorities
Kate Neill	NIWA	Scientist, large brown seaweeds citizen science project on NatureWatch NZ
Chloe Hauraki	NIWA	Range interests
Sophie Mormede	NIWA, Friends of Taputeranga Marine Reserve	Scientist, marine reserves, robust data, reef survey
Vic Metcalf	Office of the Prime Minister's Chief Science Advisor	Participatory Science Platform/Curious Minds Programme, ocean acidification citizen science
Helen Kettles	DOC Wellington	Estuaries overview, seagrass, īnanga/whitebait, ecological weeds.
Scotty Moore	DOC Whanganui	DOC projects, iwi
Nicole Miller	Wellington Underwater Club	Kelp, diving
John Booth	Fish Forever (Bay of Islands), Living Waters Bay of Islands	Marine protection, Improving quality of freshwater inflows.
Jennifer Libotte	Independent	Range interests
Nuwan De Silva		Bioindicators of health
Shane Orchard	University of Canterbury	Resource management, conservation ecology, NatureWatch NZ
Mike Hickford	University of Canterbury	Whitebait
Helen Cadwallader	University of Waikato	Tauranga stingray citizen science project
Staci King	University of Waikato	Tauranga Harbour, biosecurity monitoring, Whitianga Highschool
Annah Gerletti	Victoria University	Snorkelling projects
Amanda Clarke	University of Newcastle, Australia	Range of interests
Rick Stuart-Smith	Reef Life Survey, University of Tasmania	Rocky reef fish survey
Simon Rowe	Oceanwatch Australia	See what's happening in NZ
Sophie Powell	Reef Life Survey, University of Sydney	Whalewatching, fish survey
David Flynn	CSIRO, IMAS	Technology
Georgina Wood	Fantasea Cruising, Sydney	Whalewatching, technology

Appendix 2: Overview of Our Estuaries hub



Appendix 3: Initial list of Citizen Science Projects for the National Estuaries Research and Management Summary

Citizen science – what we found

- **NZ Landcare Trust citizen science project. Monica Peters'** PhD (University of Waikato) centred on community environmental groups working across all ecosystems including estuaries and coasts.
- **Coastal / Estuarine Bioblitzs x 5**
- **Project Hotspot.** A coastal education and monitoring project being run in Taranaki.

Project Hotspot

Cont....

- **Hauraki Gulf Community Shellfish Monitoring Programme.** 10 harbour schools, iwi, caregroups
- **Guardians of Pauatahanui Inlet (GOPI)** cockle surveys every 3 years since 1992. x8
- **Some other work at specific locations** e.g. Waimeha Restoration Group monitors water quality, Avon-Heathcote Estuary Ihutai Trust and Ngāi Tahu monitor salt marsh surveys and cultural health assessments.
- NIWA Large brown kelp project
- Mud snail size as indicator of estuary health
- Stingrays in Tauranga Harbour

Appendix 4: Key features of NatureWatch NZ for supporting CitSci in New Zealand

Cit Sci Marine Sci

IT tools for Citizen Science

Shane Orchard
NZBRN Trust
NZMSS Workshop 2016

Explore! Learn! Record!

www.naturewatch.org.nz

NWNZ - is a free tool you can use to support or create Cit Sci projects

- **Permanent global database available from any computer**
- **All organisms** – wild, domesticated, pests, tracks/sign
- **Identotron** and "**ID please**" functions (= database accuracy)
- **Photo uploads** against any record (= data quality)
- **Apps** already built for iOS & Android
- **Two-way data exchange** - upload or download any selection of data
- Create **Projects** & **Places** (user-defined to suit any purpose)
- **Alert messaging service** for any interest area or taxa
- Supports interactive **conversations & networking**
- **User defined widget** for your website / blog (good for engagement)
- Generates **maps** plus **species lists** for projects, places, (& people!)
- A range of **API allow you to add NWNZ functionality to external websites** "behind the scenes"

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