



**SCAR Sub-Group**

**ANTOS**

SG

LS/GS/PS

Person  
Responsible:

Craig Cary and  
Vonda  
Cummings

## **SCAR Delegates Report 2020**

# **Antarctic Near-shore and Terrestrial Observation System (ANTOS)**

## **2018-2020 Report**

### **Summary**

#### **Report Authors**

Craig Cary & Vonda Cummings (NZ)

#### **Summary of activities from 2018-20**

##### Major activities/achievements:

1. SCAR Integrated Science for the Sub Antarctic (ISSA) Workshop, October 2018 (Great Barrier Island, NZ). Convened by Gary Wilson and Justine Shaw, representatives of most National Programmes with jurisdiction/management in the Subantarctic attended. ANTOS was presented at the meeting to make the sub-Antarctic island community aware of ANTOS and to solicit participation in the expansion of the ANTOS network to the Subantarctic (Sub-ANTOS). This effort has already proved valuable in that the French attendees have sought support to establish 2-3 Tier 1 ANTOS towers in the Kerguelen Islands.
2. Progressed development of ANTOS baseline survey protocols, to assist new participants in obtaining the critical baseline data needed prior to the installation of a Tier 1-3 system. A trans-Tasman workshop held in August 2019, with partial support from ANTOS, facilitated protocol development. Major funding was obtained through an internal grant to Sharon Robinson (ANTOS Committee Member; (~\$28K from University of Wollongong).
3. The Italian National Antarctic Programme supported installation of new ANTOS Tier 1 systems in four Terra Nova Bay locations during 2019/20. These integrate several new sensors to measure the bioactivity of known endolithic communities. Data are being live streamed to the database, bringing the total number of on-line terrestrial ANTOS systems to eight.
4. A Canadian vendor experienced in integrating marine sensor systems in polar environments have agreed to develop a prototype telemetered (iridium) system for the near-shore component of ANTOS. Potential for their direct involvement in ANTOS to assist development of a QA/QC sensor tracking system (as they developed in the Arctic).
5. The ANTOS community was updated on the activities and progress made in 2018 at the Genoa workshop and subsequent ANTOS meeting in Leuven, via a report published on the website in late 2019 (see <https://www.scar.org/science/antos/antos-resources/>).

## ANTOS EG: 2018-2020 Report, cont.

6. ANTOS Survey II was designed and was launched in April 2020. It targets participants of the Survey I to gain more detailed information on the data stream available (incl. frequency and duration of measurements, observed environmental/ ecological responses) and participants views on the uniqueness/value of the sites. This will augment and enhance information obtained from Survey I, enabling prioritisation of the ANTOS Sentinel Sites.

### Upcoming activities:

1. Selection of ANTOS sites: Survey I and II data will be analysed to determine the identity of 25 priority ANTOS Sentinel Sites. The survey data will be analysed by an ANTOS sub-committee. Site proponents will be notified that their site has been endorsed as an ANTOS Sentinel Site with the hope that this international endorsement will support proposals to their national programmes.
2. Protocol, Guidelines and Technical manuals: Drafts of protocol, guideline, and technical manuals for ANTOS will be reviewed by the community. Virtual working group meetings will be held from mid-2020 to refine working drafts, and the final, peer reviewed versions will be released to the public by Feb 2022.
3. ANTOS Prospectus: Targeting different audiences, including (i) the Antarctic community, (ii) policy makers, and (iii) operators/logistics, and philanthropists. The Prospectus will describe the purpose and value of ANTOS to potential funders.

### Key challenges faced:

Every individual involved in ANTOS has been impacted by the COVID-19 Pandemic. Scheduled meetings have been cancelled or postponed due to the closure of borders and inability to travel. Workshops planned for 2020 will now be rescheduled for appropriate dates from late 2020 through 2021. These workshops were to finalise (i) the KOPRI-hosted database, (ii) the terrestrial and marine technical manuals, (iii) the 25 priority ANTOS Sentinel Sites, (iv) the prospectus that will be used to fund raise for the ANTOS programme, and (v) to present the above to the SCAR community. The COVID impact is likely to put us back about 12 months in our projected spending especially considering the cancellation of SCAR 2020 where we had scheduled a major workshop to present the ASS and manuals. That said, the delay will provide more time for the analysis of the survey data, development of manuals, and prospectus. Our hope would be to launch a fundraising campaign based on these outputs over the next 12 months and to run a comprehensive workshop at the SCAR OSC in 2022.

### **Summary Budget 2019 to 2022**

|        | 2019  | 2020      | 2021    | 2022    |
|--------|-------|-----------|---------|---------|
|        | Spent | Allocated | Request | Request |
| (US\$) | 1500  | 6300      | 0       | 8000    |

## Progress to date

### Sub-group Outcomes Summary

| Sub-group | Activity/Outcome/Benefit/Achievement  |
|-----------|---|
| ANTOS     | ANTOS presented at 2018 ISSC meeting/completed/ expansion of ANTOS network to the Subantarctic (Sub-ANTOS)/interest registered  |
| ANTOS     | Trans-Tasman workshop/ANTOS baseline survey protocols/ANTOS Sentinel sites will have a common baseline evaluation/protocols under development (July 2020 end date)  |
| ANTOS     | Four new ANTOS Tier 1 systems installed in Terra Nova Bay in 2019/20 /Data are being live streamed to the database/total of eight terrestrial ANTOS systems are now on-line.  |
| ANTOS     | Discussions with experienced vendors to integrate marine instrumentation for ANTOS/vendor agreed to develop a prototype telemetered (iridium) system and assist development of a QA/QC sensor tracking system/working towards an off the shelf marine ANTOS tier. |
| ANTOS     | Report to wider SCAR community on ANTOS progress and plans.   |
| ANTOS     | ANTOS Survey II designed/survey launched/ detailed information to inform prioritisation of the ANTOS Sentinel Sites/in progress (survey closes June 2020)   |

### Sub-group Cash Flow

*(From previous Delegates meeting to date)*

| Sub-group | Allocation | Amount spent |      |      |
|-----------|------------|--------------|------|------|
|           |            | 2018         | 2019 | 2020 |
| ANTOS     | 17624      | 3600         | 1500 | 900  |
|           |            |              |      |      |

## Future plans

### Planned activities in 2020 to 2022

| Sub-group | Planned activity   |
|-----------|--|
| ANTOS     | Workshop to analyse Survey I and II data/Selection of priority ANTOS Sentinel Sites (2020-2021)  |
| ANTOS     | Multiple workshops to finalise drafts of ANTOS terrestrial and marine protocol, guideline, and technical manuals (2020-2021). These will be reviewed by the community before final versions are released (by Feb 2022) |
| ANTOS     | ANTOS prospectus developed describing the purpose and value of ANTOS to potential funders.   |
| ANTOS     | Database meeting – final design and implementation   |

**Planned use of funds for 2020 to 2022**

| Year (YYYY)  | Purpose/Activity  | Amount (in USD) | Contact Name                 | Contact Email  |
|--------------|---|-----------------|------------------------------|--|
| 2020         | Database meeting (Korea)                                  | 2000            | Charles Lee & Soon Gyu Hong  | <a href="mailto:charles.lee@waikato.ac.nz">charles.lee@waikato.ac.nz</a><br><a href="mailto:polypore@gmail.com">polypore@gmail.com</a>   |
| 2020         | Two Technical Manual meetings (NZ and Canada)             | 3000            | Craig Cary & Charles Lee     | <a href="mailto:charles.lee@waikato.ac.nz">charles.lee@waikato.ac.nz</a><br><a href="mailto:vonda.cummings@niwa.co.nz">vonda.cummings@niwa.co.nz</a> ,<br><a href="mailto:caryc@waikato.ac.nz">caryc@waikato.ac.nz</a> |
| 2020         | Prospectus development and printing                       | 2000            | Craig Cary & Dana Bergstrom  | <a href="mailto:caryc@waikato.ac.nz">caryc@waikato.ac.nz</a><br><a href="mailto:dana.bergstrom@aad.govt.au">dana.bergstrom@aad.govt.au</a>   |
| 2020         | Analyse survey data and prioritise 25 sentinel sites (US) | 3000            | Byron Adams & Vonda Cummings | <a href="mailto:byron_adams@byu.edu">byron_adams@byu.edu</a><br><a href="mailto:vonda.cummings@niwa.co.nz">vonda.cummings@niwa.co.nz</a>   |
| 2021         | SCAR Biology  | 1500            | Craig Cary & Vonda Cummings  | <a href="mailto:caryc@waikato.ac.nz">caryc@waikato.ac.nz</a><br><a href="mailto:vonda.cummings@niwa.co.nz">vonda.cummings@niwa.co.nz</a>   |
| 2022         | Finalise all documents and hold workshop at OSC           | 8000            | Vonda Cummings & Craig Cary  | <a href="mailto:vonda.cummings@niwa.co.nz">vonda.cummings@niwa.co.nz</a><br><a href="mailto:caryc@waikato.ac.nz">caryc@waikato.ac.nz</a>   |
| <b>Total</b> |   |                 |                              |  |

**Any additional detail on funds usage and desired results/outcomes**

Please note that these are wishful projections as much will depend on the global COVID situation and our ability to travel. We will attempt to do as much as we can with teleconferencing but nothing replaces face to face to get action and results.

**Percentage of the budget to be used for support of early-career researchers**

2020: 20%  
2021: 20%  
2022: 30%

**Percentage of the budget to be used for support of scientists from countries with developing Antarctic programmes**

2020: 30%  
2021: 30%  
2022: 30%

## Membership

### Leadership

Please identify early-career researchers with \* in first column

| Role            | First Name | Last Name | Affiliation | Country | Email  | Date Started |
|-----------------|------------|-----------|-------------|---------|--|--------------|
| <b>Co-Chair</b> | Craig      | Cary      | U. Waikato  | NZ      | <a href="mailto:caryc@waikato.ac.nz">caryc@waikato.ac.nz</a>             | 8/2014       |
| <b>Co Chair</b> | Vonda      | Cummings  | NIWA        | NZ      | <a href="mailto:vonda.cummings@niwa.co.nz">vonda.cummings@niwa.co.nz</a> | 8/2014       |
| <b>Sec</b>      | *Megumu    | Tsujimoto | MPR         | Japan   | <a href="mailto:megumutsujimoto@gmail.com">megumutsujimoto@gmail.com</a> | 8/2014       |

### Other members

| First Name | Last Name    | Affiliation                           | Country   | Email  |
|------------|--------------|---------------------------------------|-----------|--|
| Byron      | Adams        | Brigham Young University              | USA       | <a href="mailto:byron_adams@byu.edu">byron_adams@byu.edu</a>                       |
| *Charles   | Lee          | Waikato University                    | NZ        | <a href="mailto:cklee@waikato.ac.nz">cklee@waikato.ac.nz</a>                       |
| Dana       | Bergstrom    | Australian Antarctic Division         | Australia | <a href="mailto:dana.bergstrom@aad.gov.au">dana.bergstrom@aad.gov.au</a>           |
| Dolores    | Deregibus    |                                       | Argentina | <a href="mailto:dolidd@yahoo.com">dolidd@yahoo.com</a>                             |
| Eli        | Verleyen     |                                       | Belgium   | <a href="mailto:Elie.Verleyen@UGent.be">Elie.Verleyen@UGent.be</a>                 |
| Emmanuelle | Sultan       | Museum National d' Historie Meleuelle | France    | <a href="mailto:esulod@locean-ipsl.upmc.fr">esulod@locean-ipsl.upmc.fr</a>         |
| Marcela    | Libertelli   | Instituto Antártico Argentino         | Argentina | <a href="mailto:mllibertelli5@yahoo.com.ar">mllibertelli5@yahoo.com.ar</a>         |
| Peter      | Convey       | BAS                                   | UK        | <a href="mailto:pcon@bas.ac.uk">pcon@bas.ac.uk</a>                                 |
| Sharon     | Robinson     | University of Wollongong              | Australia | <a href="mailto:sharonr@uow.edu.au">sharonr@uow.edu.au</a>                         |
| Soon Gyu   | Hong         | KOPRI                                 | Korea     | <a href="mailto:polypore@gmail.com">polypore@gmail.com</a>                         |
| Stefano    | Schiaparelli | Unige of MNA                          | Italy     | <a href="mailto:stefano.schiaparelli@unige.it">stefano.schiaparelli@unige.it</a>   |
| Steve      | Colwell      | PSG rep                               | UK        | <a href="mailto:src@bas.ac.uk">src@bas.ac.uk</a>                                   |
| Mauro      | Guglielmin   | ANTPAS rep                            | Italy     | <a href="mailto:mauro.guglielmin@uninsubria.it">mauro.guglielmin@uninsubria.it</a> |

## Additional information (optional)

### Notable Papers

(Five to ten most notable papers – see the example below, which includes a brief statement (shaded) indicating the link to the group)

### Direct support from outside organisations received for your activities

(Numbered list with values indicated if direct cash support. Please restrict in-kind support to substantive in-kind support only)

1. The New Zealand Antarctic Research Institute, instruments and logistics - \$25K

2. Antarctica New Zealand – subsequent in kind logistics support - ~\$50K
3. University of Waikato, New Zealand – instrumentation and salary - ~\$30K
4. National Institute of Water and Atmospheric Research, New Zealand - instrumentation and salary - ~\$30K
5. ECO-Antarctica – attendance for meeting, workshop, and subsequent follow up work, U. Wollongong, Australia \$28K.

## Major collaborations your Science Group has with other SCAR groups and with organisations/groups beyond SCAR

### Within SCAR

1. ISSA – ANTOS has linked with this programme and hopes to develop a significant extension of the network into the Sub-Antarctic islands

### Outside SCAR

1. NZARI – The New Zealand Antarctic Research Institute has co-supported the placement of two ANTOS Tier 1 systems at Cape Adare, Victoria Land. Antarctica New Zealand through the Antarctic Science Platform have agreed to maintain these very remote but critical systems for at least the next seven years.
2. ECO-Antarctica (a project within the U. Wollongong’s Global Challenge initiative) –The aims of ECO-Antarctica are to bring together the newly formed trans-Tasman network, understand the current state of monitoring Antarctic ecosystems, to start developing an ANTOS field manual and plan how we move forward in order to develop an Antarctic-wide observing system for near-shore and terrestrial ecosystems.
3. New Zealand Antarctic Science Platform – Science objectives within Project 3 (*Ross Sea Region ecosystem dynamics in a warming world*) include installation of ANTOS tiers to gather biologically relevant environmental information

## Outreach, communication and capacity-building activities

*Brief highlights of any activities undertaken since the SCAR Delegates meeting in 2018.*

Cummings, V.J., Cary, S.C. (2019). ANTOS. Presentation to Trans-Tasman ECO-Antarctica Workshop, Austinmer, NSW, Australia, 19-23 August.

Report on the ECO-Antarctica Workshop, prepared for to the Global Challenges Program, University of Wollongong (September 9<sup>th</sup> 2019). *Copy available on request.*

## SCAR fellowship reviewers

*Please list one or more people (name and email address) from your group who would be willing to serve as reviewers for the next few years, along with 1-3 keywords on their principal expertise.*

| First Name | Last Name | Email                     | Principal Expertise                    |
|------------|-----------|---------------------------|--|
| Craig      | Cary      | caryc@waikato.ac.nz       | Microbial ecology                      |
| Vonda      | Cummings  | vonda.cummings@niwa.co.nz | Marine ecology, benthos, ecophysiology |
|            |           |                           |  |
|            |           |                           |  |