

## List of projects for the COMNAP Antarctic Fellowship 2019

Priority Topics for 2019 are:

- Operation and management of Antarctic aviation capabilities, including, but not limited to application of remotely piloted aircraft for scientific, operational or conservation purposes.
- Alternative energy systems in cold climate and any cold climate engineering: including, but not limited to buildings, mechanical, systems, remote autonomous systems.
- Best collaborative use of new marine research vessels in support of science, including advanced exchange of science voyage information.
- Understanding the environmental issues from direct human impacts arising from Antarctic science and operations including cumulative impacts; Understanding plastic waste introduction and removal options so as to eliminate introduction of plastics including micro-plastics from the Antarctic environment; understanding management implications of environmental change to National Antarctic Program activities; Development of best practice related to risk reduction from non-native species intra-regionally in the Antarctic.
- Human safety, including, but not limited to equipment, clothing, operating procedures and search and rescue.
- Legal/administrative issues relating to COMNAP's internal functioning and/or its relationship with any other component of the Antarctic Treaty System.
- Improving, developing or exchanging information on education and outreach related to National Antarctic Program / COMNAP activities.

The "priority list" for 2019, is taken from a list of other, broad topics that are of interest to COMNAP and will be considered:

1. Air Operations
  - a. Use of Remotely Piloted Aircraft Systems in support of Antarctic science
  - b. Use of Remotely Piloted Aircraft Systems in support of Antarctic operations
  - c. Use of Remotely Piloted Aircraft Systems in support of Antarctic logistics
  - d. Use of Remotely Piloted Aircraft Systems in support of Antarctic science and understanding of wildlife benefits and risks
2. Energy & Technology
  - a. Stream-lining remote field camp set-up
  - b. Reduction of fossil fuel use at remote field camps
  - c. Reduction of fossil fuel use at winter-over stations
  - d. Reduction of fossil fuel use at seasonal stations
  - e. Cost/benefit analysis of fossil fuel use in Antarctic logistics (ships, aircraft, traverse etc)
  - f. COMNAP Antarctic Roadmap Challenges (ARC) results with a focus on filling a gap in one of the technologies required but not currently available
3. Engineering
  - a. Station design
  - b. Remote Field Camp/"Super-site" design
  - c. Ship design
  - d. Science support equipment design
  - e. Medical-related design

4. Environment
  - a. Waste treatments and waste management at Antarctic facilities
  - b. Mitigation strategies for the introduction of non-native species in the Antarctic
5. Medical
  - a. Medical “wastes” into Antarctic waters
  - b. Best practice for returning medical supplies and medicines from Antarctica
  - c. Ensuring quality of drinking water on stations and in the field, and at those stations which have them, the monitoring of the quality and/or bacteria content of spa waters and the need for associated bacteria monitoring programmes
  - d. Transportation of patients onto and between various aircraft (also linked with engineering/technology)
  - e. Inability to hold certain drugs, such as narcotics, at stations due to legal definitions and domestic legislation restrictions
6. Safety
  - a. Clothing fit for purpose
  - b. Crevasse detection
  - c. Avoiding carbon monoxide poisoning
  - d. Reducing risk related to fire emergencies
  - e. Snow mobile/ski-do safe use
  - f. Diving safety
  - g. Technology to deconflict airspace
7. Science
  - a. Increasing understanding in relation to any of the 80 SCAR Horizon Scan critical science questions
  - b. Understanding uptake and implementation of the recommendations in the COMNAP Antarctic Roadmap Challenges (ARC) project
  - c. Improving facilitation of science
  - d. Improving international co-operation on big science projects
8. Social Science
  - a. Human dimension of winter-over situations
9. Humanities
10. Law
  - a. COMNAP’s role within the ATCM
  - b. COMNAP’s contribution to discussions in ATCM Working Group 2
11. Shipping/Ship Operations
  - a. Efficient design strategies for ice-breaking vessels
  - b. The Implementation of the IMO Polar Code
  - c. Technology to better understand sea-ice conditions
12. Education
13. Outreach/Media/Communications

14. Search and Rescue

- a. Improving co-ordination and response in times of Antarctic emergency and medical evacuations

15. Data Management