**List of projects for the COMNAP Antarctic Fellowship 2024**

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|  | **Priority Topics for the COMNAP Antarctic Fellowship 2024** |
| Priority | * Decarbonisation of Antarctic activities coupled with efficiency improvements and off-setting possibilities. Alternative non-fossil fuel energy systems in cold climates and any cold climate engineering: including, but not limited to buildings, mechanical, systems, remote autonomous systems. * Understanding the environmental issues from direct human impacts arising from Antarctic science and operations including cumulative impacts; Understanding plastic waste sources 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; Understanding of the possible environmental implications of changes to the built environment in a changing Antarctica; 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. * Increasing opportunities to support equity, diversity and inclusivity in national Antarctic programmes and in Antarctic activity. * Implementation of aircraft tracking technologies, deconfliction of airspace and positional awareness (Air operations and safety). * Implication of IMO Ballast Water Convention for national Antarctic program vessels. * Highly Pathogenic Avian Influenza (HPAI) preparedness and response guidance and in respect to expeditioners’ health, and heightened biosecurity measures. |
|  | **Broader Topics of COMNAP interest** |
| Air Operations | * 1. Operation and management of Antarctic aviation capabilities, including, but not limited to application of remotely piloted aircraft for scientific, operational or conservation purposes   2. Use of Remotely Piloted Aircraft Systems in support of Antarctic science, operations, logistics and science’s support, and understanding of wildlife benefits and risks |
| Energy & Technology | 1. Stream-lining remote field camp set-up 2. Safe reduction of fossil fuel use in operations, logistics and science’s support in particular Antarctic conditions 3. Cost/benefit analysis and quantification of fossil fuel use in Antarctic logistics 4. Energy needs for winter operated facilities |
| Engineering | 1. Station design 2. Remote Field Camp/“Super-site” design 3. Ship design 4. Science support equipment design 5. Medical-related design 6. Improvements in field deployable infrastructure and equipment |
| Environment | 1. Addressing risk/vulnerability to the built Antarctic environment in a changing world (also linked with safety) 2. Waste treatments and waste management at Antarctic facilities 3. Mitigation strategies for the introduction of non-native species in the Antarctic 4. Vessel marine noise reduction |
| Law | 1. COMNAP’s role within the ATCM 2. COMNAP’s contribution to discussions in ATCM Working Group 2 3. COMNAP’s contribution to discussions within the CEP |
| Medical | 1. Pandemic preparedness and response; Infectious disease management and response 2. Best practice for returning medical supplies and medicines from Antarctica 3. 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 4. Transportation of patients onto and between various aircraft (also linked with engineering/technology) 5. Inability to hold certain drugs, such as narcotics, at stations due to legal definitions and domestic legislation restrictions (also linked to domestic law) 6. Mental wellbeing of Antarctic expeditioners (also linked with social science and humanities) |
| Safety | 1. Clothing fit for purpose 2. Crevasse detection 3. Education on and avoiding carbon monoxide poisoning 4. Reducing risk related to fire emergencies 5. Snow mobile/ski-doo safe use 6. Diving safety 7. Identifying risks and preparedness in relation to natural hazards. |
| Science | 1. Increasing understanding in relation to any of the 80 SCAR Horizon Scan critical science questions 2. Understanding uptake and implementation of the recommendations in the COMNAP Antarctic Roadmap Challenges (ARC) project 3. Improving facilitation of science 4. Best collaborative use of new marine research vessels in support of science, including advanced exchange of science voyage information 5. Improving international co-operation on big science projects 6. Data Management 7. Requirements for successful monitoring programmes |
| Search and Rescue | * 1. Improving co-ordination and response in times of Antarctic emergency and medical evacuations (also linked with medical)   2. Development and improved use of tools to improve communications and situational awareness in times of accident, incident or emergency (also linked to technology) |
| Shipping/Ship Operations | 1. Efficient design strategies for ice-breaking vessels 2. Implementation challenges of the IMO Polar Code 3. Technology to better understand sea-ice conditions |
| Social Science & Humanities | 1. Human dimension of winter-over situation 2. Education 3. Outreach/Media/Communications 4. Communicating the importance of Antarctica in a changing world 5. Global social-economic and society impacts and consequences in a changing world 6. Contributing to the conversation on Antarctica’s global role in climate change |