



Paper 6 **Agenda 2.1**

SG GS

Person Responsible: Jesús Galindo

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

SSG Geosciences **2016-2017 Report**

Report Author(s):

Jesús Galindo-Zaldívar (Chief Officer), Naresh C. Pant (Deputy Chief Officer), Marcelo Leppe (Secretary). Contributions of Chief Officers of Expert Groups and Action Groups.

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

SSG-Geosciences include 6 expert and 4 action groups, two of them cross-disciplinary. These groups are active, have regular meetings (e.g. OSC, AGU, URSI GASS, IAGA) and promote new meetings (e.g. 1st International Antpas Workshop, Varese). Their activities include the production of maps (Bathymetry and Geological Setting of the Drake Passage; Antarctic Digital Magnetic Anomaly Map 2, in latest stages of preparation; International Bathymetric Chart of the Southern Ocean V2.0., initiated; Geological maps compilation and integration). Moreover, groups aim to identify long term datasets, continuing the database development, and developing technical manuals and field researches (like GNSS measurements, geophysical and geological observations). Publications of results are envisaged in high-profile international geoscientific journals and special volumes. It is also remarkable the preparation of information papers (e.g. conservation strategies for Antarctic geological and geomorphological features, including fossils, with the aims that SCAR will delivery advice on this matter to CEP, ATS).

Recommendations that EXCOM should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

We recommend the continuity of the actions and expert groups and the confirmation of ongoing budget.

GIANT

Geodetic GNSS observations on bedrock in Antarctica are indispensable since they provide the only in-situ measurement of recent deformations of the Earth crust. Thus, these measurements are being used in manifold respects of Antarctic research. The scientific aspects are especially covered by the SCAR Scientific Research Program SERCE and the Expert Group GIANT.

Each of these geodetic GNSS measurements is essentially based on a stable marker that is directly connected to bedrock. Only in this way it can be ensured that exactly the same point is being occupied each time an observation is repeatedly carried out or realized in terms of a time series recording.

In view of funding issues and the environmental protection in Antarctica the question was raised whether these markers could be removed.

Together with the SCAR SRP SERCE Steering Committee we ask for a recommendation of the EXCOM that the geodetic markers on bedrock in Antarctica should be maintained in order to enable GNSS measurements being carried out at later times at exactly the same point.

(Contact to SCAR SRP SERCE: Pippa Whitehouse, Matt King, Terry Wilson).

ANTPAS

EXCOM should promote more relations and interactions between Antera, Anteco, Antos and Antpas because they are working at least in part on integrable topics and issues and more synergy will be a benefit for everybody.

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

-Most of the groups have meet one or several times.

-Bathymetry and Geological Setting of the Drake Passage Map, was released in Dec, 2016. It is an SCAR product.

ADMAP Preparation of the second edition of the Antarctic Digital Magnetic Anomaly Map (ADMAP2) and database is in the final stages.

ANTOS Measurement system technical manual (hardware, biological and environmental assessment, mapping, and monitoring schedule) is prepared;

Database management is designed by KOPRI; Survey launch: a web-based survey that will be used to poll the international research community about where infrastructure currently exists to collect long-term ecological and environmental data, where long term data are already being collected, and where investment is most needed to collect such data; Atlas of Ice Free Areas of Antarctica (AIFAA), product expected in 12-18 months from the BAS.

ANTPAS Meeting held in 2016 at Potsdam (Germany) during the International Permafrost Conference (IPA) in June and afterwards on SCAR-OSC at Kuala Lumpur. Process of internal review in order to define the new science priorities.

ANTVOLC A dedicated AntVolc website has been released, hosted at the Institute of Earth Sciences Jaume Almera (ICTJA-CSIC) (<https://antvolcscar.wordpress.com/>). Also development of a new AntVolc website (<https://antvolcscar.wordpress.com/>).

GEOLOGICAL HERITAGE AND GEOCONSERVATION

This group aims to consider a code of conduct that would include advice relevant to geology, palaeontology, geomorphology and meteorite studies, particularly sampling protocols, with a delivery date for the Code of Conduct possibly in time for CEP 2019

GEOMAP Collaboratively build a modern geological dataset that classifies and describes the bedrock and surficial geology of Antarctica's rock exposures. The work is in progress.

GIANT Continuation of geodetic measurements in Antarctica, especially of geodetic GNSS; Relaunch of "SCAR GNSS Database" website; Publication of gridded dataset of gravity anomalies for Antarctica (Scheinert et al., Geophysical Research Letters, 2016); Launch of "Geodynamics In ANTArctica based on REprocessing GNSS dAta Initiative"(GIANT-REGAIN); International Workshop "Airborne Geodesy and Geophysics with Focus on Polar Applications", Dresden, Germany, 19-21 April 2017.

GRAPE Observing infrastructures (mainly based on GNSS receivers able to monitor ionospheric TEC and scintillations) is growing above all over Antarctica. A new Scientific Program proposal submitted in May 2017 to SCAR. The proposal, titled RESOURCE (Radio Sciences Research on AntarctiC AtmospherE). The main goal of the proposal, is to isolate the atmospheric contribution and use it in the study of the near-earth space environment.

IBCSO Meetings to preventing double acquisitions and enables listing of data that in the future can be incorporated in an IBCSO V2.0. Since 2017 IBCSO is part of the GEBCO initiative Seabed 2030 and AWI will become a Regional Data Assembly and Coordination Centre.

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

ADMAP Publication of the second edition of the Antarctic Digital Magnetic Anomaly Map (ADMAP2) and database is in the final stages. Publication is envisaged in a high-profile international geoscientific journal and a print version of the map.

ANTOS Several initiatives. It is remarkable to conduct a survey to identify potential high priority ANTOS sites and found support for installation.

ANTPAS This group aims enhance: ANTPAS communications; State of the Antarctic active layer CALM paper to Polar Geography; ANTPAS Permafrost and soils monitoring network – linking with GTN-P and CALM; Permafrost map of the World (IPA) – follow up possible meeting in Sapporo 2017; Project Planning – ecosystem services in Antarctica; Project planning – Brines/Mars environments; Selection of SCAR Horizon Scan questions; ANTPAS Terms of Reference. The 1st International Antpas Workshop entitled “From an Expert Group to a Research Program” will be held on 4-5 October in Varese at Insubria University.

ANTVOLC The second AntVolc workshop is scheduled for 22-24 November, at Barcelona. Session dedicated to bipolar magmatic, tectonic & geodynamic investigations will take place at POLAR2018. Editing special volume on Volcanism in Antarctica (memoir of the Geological Society, London). White Paper’ for SCAR summarizing the state of research into Antarctic volcanism and provide a roadmap for future volcanic research (late 2018).

GIANT Continuation of geodetic GNSS observations on bedrock. M. King (University of Tasmania, Australia) and M. Scheinert (TU Dresden, Germany) launched “Geodynamics In ANTArctica based on REprocessing GNSS dAta Initiative” (**GIANT-REGAIN**) with major processing activity in 2017/2018. A 2nd “SCAR Summer School on Polar Geodesy” will be held in Ladojskoje Ozero, Russia (near St. Petersburg). Participation in International Workshop on “Glacial Isostatic Adjustment and Elastic Deformation” to be held in Reykjavik, Iceland, 5-7 September 2017, and the next SCAR Meeting in Davos, 2018.

GEOLOGICAL HERITAGE AND GEOCONSERVATION

The focus of the next 6 months will be to finalise a draft information paper, to be circulated to members of the Action Group for input and comment for a final version to be submitted to SCAR Standing Committee on the Antarctic Treaty System (SCATS) for consideration in April 2018.

Primary objective is to deliver a document addressing conservation of Antarctic geological and geomorphological values (including fossils) to be used for SCAR’s advice on this matter to the CEP.

GEOMAP July-Aug 2017 Complete capture of Peninsula geology. Finalise north Victoria Land glacial geology. Aug-Jan 2017, Review cTAM glacial Geology. Improve definition of Ferrar-Beacon rocks. Jan-May 2018 Integration of Norwegian Polar Institute data from Dronning Maud Land. Capture eastern

Antarctic dataset. June 2018, Next main meeting of GeoMAP (at Davos Polar 2018 conference). Possible first version release of the beta-version of dataset for peer review and discussion. July-Nov 2018, Workshop of key action group members to review and harmonise seamless dataset. Jan-Jun 2019, Finalise data into GeoSciML.

GRAPE Efforts will be addressed to the activities proposed within RESOURCE. A scientific session has been planned within SCAR OSC 2018 titled: The Polar Atmosphere and Geospace as well the GRAPE-RESOURCE. Participation in the course “The Polar Upper Atmosphere: from science to operational issues” is scheduled in September 2018 at L’Aquila (IT).

IBCSO Details about the Seabed 2030 initiative will be discussed at the GEBCO Meeting in November 2017, Busan, South Korea. A kick-off meeting of IBCSO V2.0 is planned for the SCAR/IASC conference 2018 in Davos, Switzerland and IBCSO V2.0 is intended to start at this time. IBCSO V2.0 is intended to extent up to 50° S with a resolution of 500 m. Additional data sets have already been identified and will continue to be acquired in the next years.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

-Bathymetry and Geological Setting of the Drake Passage Map (Scar Product) (Dec, 2016)

ADMAP

2017

Jordan, T.A., Ferraccioli, F, and Leat, P.T. (2017), New geophysical compilations link crustal block motion to Jurassic extension and strike-slip faulting in the Weddell Sea Rift System of West Antarctica, *Gondwana Research* 42, 29-48.

2016

Maritati, A., A. R. A. Aitken, D. A. Young, J. L. Roberts, D. D. Blankenship, and M. J. Siegert (2016), The tectonic development and erosion of the Knox Subglacial Sedimentary Basin, East Antarctica, *Geophys. Res. Lett.*, 43, 10,728–10,737, doi:10.1002/2016GL071063

F. J. Davey, R Granot, S. C. Cande, J. M. Stock, M. Selvans, F. Ferraccioli, 2016. Synchronous Oceanic Spreading and Continental Rifting in West Antarctica. *Geophysical Research Letters*, DOI: 10.1002/2016GL069087.

A. R. A. Aitken, J. L. Roberts, T. D. van Ommen, D. A. Young, N. R. Golledge, J. S. Greenbaum, D. D. Blankenship & M. J. Siegert, 2016. Repeated large-scale retreat and advance of Totten Glacier indicated by inland bed erosion. *Nature* 533, 385-389, doi:10.1038/nature17447

A.R.A. Aitken, P.G. Betts, D.A. Young, D.D. Blankenship, J.L. Roberts, M.J. Siegert, 2016. The Australo-Antarctic Columbia to Gondwana transition. *Gondwana Research*, 29 (1), 136-152, doi:10.1016/j.gr.2014.10.019.

Frederick, B. C., Young, D. A., Blankenship, D. D., Richter, T. G., Kempf, S. D., Ferraccioli, F., and Siegert, M. J., 2016, Distribution of subglacial sediments across the Wilkes Subglacial Basin, East Antarctica, *Journal Of Geophysical Research: Earth Surface*, 121, 4, 790–813, 10.1002/2015JF003760

ANTOS

Report on the 2016 Antarctic Near-shore and Terrestrial Observing System (ANTOS) Action Group Workshop.

http://www.scar.org/scar_media/documents/science/antos/2015-ANTOS-Workshop-Report.pdf)

ANTPAS

A special issue related to the 1st International Antpas Workshop entitled “From an Expert Group to a Research Program” that will be held on 4-5 October in Varese has been proposed to different ISI Journals and is under evaluation. A synthesis paper of GTN-P with large part of Antarctic permafrost temperature data has been finalizing.

ANTVOLC:

Special volume: ‘Volcanism in Antarctica: 200million years of subduction, rifting & continental break-up’ is now underway. It will be published as a Memoir of the Geological Society, London.

(late) 2015:

- Almendros, J., Carmona, E., Jiménez, V., Díaz, A., Lorenzo, F., Berrocoso, M., De Gil, A., Fernández-Ros, A. and Rosado, B. 2015. Deception Island: Sustained deformation and large increase in seismic activity during the 2014-2015 survey, in: Venzke, E (ed.), *Bulletin of the Global Volcanism Network*, 40:6, Smithsonian Institution.
- Del Carlo P., Di Roberto A., Di Vincenzo G., Bertagnini A., Landi P., Pompilio M., Colizza E., Giordano G. (2015). Late Pleistocene-Holocene volcanic activity in northern Victoria Land recorded in Ross Sea (Antarctica) marine sediments. *BULLETIN OF VOLCANOLOGY*, vol. 77, ISSN: 0258-8900, doi: [10.1007/s00445-015-0924-0](https://doi.org/10.1007/s00445-015-0924-0)
- Ilanko, T., Oppenheimer, C., Burgisser, A. & Kyle, P. 2015, Transient degassing events at the lava lake of Erebus volcano, Antarctica: Chemistry and mechanisms, *GeoResJ*, 7, 43–58.
- Ilanko, T., Oppenheimer, C., Burgisser, A. & Kyle, P. 2015. Cyclic degassing of Erebus volcano, Antarctica, *Bulletin of Volcanology*, 77: 56
- Jones, L. K., Kyle, P. R., Oppenheimer, C., Frechette, J. D., & Okal, M. H. (2015). Terrestrial laser scanning observations of geomorphic changes and varying lava lake levels at Erebus volcano, Antarctica. *Journal of Volcanology and Geothermal Research*, 295, 43-54.
- Le Losq, C., Neuville, D.R., Moretti, R., Kyle, P.R., and Oppenheimer, C. 2015, Rheology of phonolite magmas – the case of the Erebus lava lake, *Earth and Planetary Science Letters*, 411, 53–61.
- Martin, A.P.; Price, R.C.; Cooper, A.F.; McCammon, C.A. 2015. Petrogenesis of the rifted Southern Victoria Land lithospheric mantle, Antarctica, inferred from petrography, geochemistry, thermobarometry and oxybarometry of peridotite and pyroxenite xenoliths from the Mount Morning eruptive centre. *Journal of Petrology*, 56(1): 193-226.
- Martin, A.P., Cooper, A.F., Price, R.C., Turnbull, R.E. and Roberts, N.M.W. 2015 The petrology, geochronology and significance of Granite Harbour Intrusive Complex xenoliths and outcrop sampled in western McMurdo Sound, Southern Victoria Land, Antarctica. *New Zealand Journal of Geology and Geophysics*, 58(1): 33-51.
- Molina, I., Burgisser, A., & Oppenheimer, C. 2015. A model of the geochemical and physical fluctuations of the lava lake at Erebus volcano, Antarctica. *Journal of Volcanology and Geothermal Research*, 308, 142-157.
- Padrón, E., Hernández, P. A., Carmona, E., Pérez, N., Melián, G., Sumino, H., Almendros, J., Kusakabe, M., Wakita, H., Padilla, G. 2015. Geochemical evidence of different sources of long-period seismic events at Deception volcano, South Shetland Islands, Antarctica, *Antarctic Science* 27, 557-565.
- Park, Y., Yoo, H.J., Lee, Ch-K., Lee, J., Park, H., Kim, J. and Kim, Y. 2015. P-wave velocity structure beneath Mt. Melbourne in northern Victoria Land, Antarctica: Evidence of partial melting and volcanic magma sources. *Earth & Planetary Science Letters*, 432, 293-299.
- Prudencio, J., De Siena, L., Ibáñez, J. M., Del Pezzo, E., Garcia-Yeguas, A. and Diaz-Moreno, A. 2015. The 3D attenuation structure of Deception Island (Antarctica), *Surveys in Geophysics*, 36, 371-390.

[SCAR SSG-Geosciences]: 2016-2017 Annual Report, cont.

Vignaroli G, Balsamo F, Giordano G, Rossetti F, Storti F (2015). Miocene-to-Quaternary oblique rifting signature in the Western Ross Sea from fault patterns in the McMurdo Volcanic Group, north Victoria Land, Antarctica. *TECTONOPHYSICS*, vol. 656, p. 74-90.

2016:

Bohoyo, F., Larter, R.D., Galindo-Zaldivar, J., Leat, P.T., Maldonado, A., Tate, A.J., Gowland, E.J.M., Arndt J.E., Dorschel, B., Kim, Y.D., Hong, J.K., Flexas, M.M., López-Martínez, J., Maestro, A., Bermudez, O., Nitsche, F.O., Livermore, R.A. and Riley, T.R. 2016. Bathymetry and Geological Setting of the Drake Passage (1:1 500 000) BAS GEOMAP 2 Series (Sheet 7) British Antarctic Survey, Cambridge, UK.

Iacovino, K., Oppenheimer, C., Scaillet, B., & Kyle, P. 2016. Storage and evolution of mafic and intermediate alkaline magmas beneath Ross Island, Antarctica. *Journal of Petrology*, 57, 93-118.

Leat, P.T., Fretwell, P.T., Tate, A.J., Larter, R.D., Martin, T.J., Smellie, J.L., Jokat, W. and Bohrmann, G. 2016. Bathymetry and geological setting of the South Sandwich Islands volcanic arc. *Antarctic Science*, 28, 293-303.

LeMasurier, W.E., Choi, S.H., Hart, S.R., Mukasa, S.B., Rogers, N.W., 2016. Reconciling the shadow of a subduction signature with rift geochemistry and tectonic environment in eastern Marie Byrd Land, Antarctica. *Lithos* 260, 134-153.

Liu, E.J., Oliva, M., Antoniades, D., Giralt, S., Granados, I., Pla-Rabes, S., Toro, M. and Geyer, A., 2016. Expanding the tephrostratigraphical framework for the South Shetland Islands, Antarctica, by combining compositional and textural tephra characterisation. *Sedimentary Geology*, 340, pp.49-61.

Narcisi, B., Petit, J.R., Langone, A. and Stenni, B. 2016. A new Eemian record of Antarctic tephra layers retrieved from the Talos Dome ice core (Northern Victoria Land). *Global and Planetary Change*, 137, 69–78.

Oliva, M., Antoniades, D., Giralt, S., Granados, I., Pla-Rabes, S., Toro, M., Liu, E.J., Sanjurjo, J. and Vieira, G. 2016. The Holocene deglaciation of the Byers Peninsula (Livingston Island, Antarctica) based on the dating of lake sedimentary records. *Geomorphology*, 261, pp.89-102.

Petit, J.R., Narcisi, B., Batanova, V.G., Savarino, J., Komorowsky, J.C., Michel, A., Metric, N., Besson, P., Vidal, C. and Alexander V. Sobolev. A.V. 2016. Identifying the AD 1257 Salamas volcanic event from micron-size tephra composition in two East Antarctic ice cores. *Geophysical Research Abstracts*, 18, EGU2016-5191.

2017:

Avery, M., Panter K.S., Gorsevski, P.V. (2017), Distinguishing styles of explosive eruptions at Erebus, Redoubt and Taupo volcanoes using multivariate analysis of ash morphometrics, *Journal Volcanology & Geothermal Research*, 10.1016/j.jvolgeores.2017.01.010

Narcisi, B., Petit, J.R. and Langone, A. 2017. Last glacial tephra layers in the Talos Dome ice core (peripheral East Antarctic Plateau), with implications for chronostratigraphic correlations and regional volcanic history. *Quaternary Science Reviews*, 165, 111-126.

Riley, T.R., Flowerdew, M.J., Pankhurst, R.J., Leat, P.T., Millar, I.L., Fanning, C.M. and Whitehouse, M.J. 2017. A revised geochronology of Thurston Island, West Antarctica, and correlations along the proto-Pacific margin of Gondwana. *Antarctic Science*, 29, 47-60.

Masters theses:

Avery, Meredith. 2015. Multivariate Analysis of Volcanic Particle Morphology: Methodology and Application of a Quantitative System of Fragmentation Mechanism Classification. M.S. Thesis. Bowling Green State University, USA. 171 p.

González Álvarez, I. N. 2016. Study of wave propagation anomalies at Deception Island volcano using numerical simulations and array techniques, MSc Thesis, Almendros, J. (advisor), MSc in Geophysics and Meteorology, University of Granada, Spain.

Díaz Gato, D. 2016. Análisis de terremotos volcánicos de la isla Decepción (Antártida) con técnicas de array, MSc Thesis, Carmona, E. (advisor), MSc in Geophysics and Meteorology, University of Granada, Spain.

Mead, S. 2016. Origin of sodic magma series: a comparative study of Deception Island, Antarctica, and Savo, Solomon Islands. MSc Thesis, University of Leicester, UK. [unpubl.]

Redner, Ellen. 2016. Magma Mixing and Evolution at Minna Bluff, Antarctica Revealed by Amphibole and Clinopyroxene Analyses. M.S. Thesis. Bowling Green State University, USA. 214 p.

GEOMAP

A new dataset is 90% complete for the Ross Sea Region.

GEOLOGICAL HERITAGE AND GEOCONSERVATION

AG has been requested to provide a short editorial to *Antarctic Geoscience* journal on Geological heritage and geoconservation issues. Will be completed late July 2017.

GIANT

Scheinert, M.; Ferraccioli, F.; Schwabe, J.; Bell, R.; Studinger, M.; Damaske, D.; Jokat, W.; Aleshkova, N.; Jordan, T.; Leitchenkov, G.; Blankenship, D. D.; Damiani, T. M.; Young, D.; Cochran, J. R.; Richter, T. D. (2016): New Antarctic Gravity Anomaly Grid for Enhanced Geodetic and Geophysical Studies in Antarctica. *Geophysical Research Letters*, 1944-8007, doi: 10.1002/2015GL067439

The datasets are published at <https://doi.org/10.1594/PANGAEA.848168>

GRAPE

Web page: www.grape.scar.org (updating is in progress and a new version will be soon available).

2016

Alfonsi, L., Cilliers, P. J., Romano, V., Hunstad, I., Correia, E., Linty, N., ... & Riley, P. (2016). First observations of GNSS ionospheric scintillations from DemoGRAPE project. *Space Weather*, 14(10), 704-709, doi:10.1002/2016SW001488.

Correia, E., Quevedo, M.T., Paz, A. J. . ANTARCTIC ATMOSPHERE RESPONSE TO THE SUN-EARTH INTERACTIONS. Annual Activity Report - INCT-APA, v. x, p. 15-22, 2016.

Linty, N., Romero, R., Cristodaro, C., Dovic, F., Bavaro, M., Curran, J. T., ... & Cilliers, P. (2016, May). Ionospheric scintillation threats to GNSS in polar regions: the DemoGRAPE case study in Antarctica. In *Navigation Conference (ENC), 2016 European* (pp. 1-7). IEEE. doi: 10.1109/EURONAV.2016.7530546

Linty, N., I. Hunstad, " Installation and configuration of an Ionospheric Scintillation Monitoring Station based on GNSS receivers in Antarctica. *RAPPORTI TECNICI INGV*, 2016, 354: 1-28. N

Negusini, M., B. H. Petkov, P. Sarti and C. Tomasi, (May 2016) "Ground-Based Water Vapor Retrieval in Antarctica: An Assessment," in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 54, no. 5, pp. 2935-2948, doi: 10.1109/TGRS.2015.2509059.

Pignalberi, A ; Pezzopane, M ; Tozzi, R ; De Michelis, P; Coco, I: Comparison between IRI and preliminary Swarm Langmuir probe measurements during the St. Patrick storm period, *Earth, Planets and Space*, 68, 93, doi: 10.1186/s40623-016-0466-5, 2016.

Prikryl, P., Ghoddousi-Fard, R., Ruohoniemi, J. M., Thomas, E. G.: GPS phase scintillation at high latitudes during two geomagnetic storms, *Auroral dynamics and space weather*, *Geophysical Monograph Series Vol. 215*, Zhang, Y. and Paxton, L.J. (Editors), American Geophysical Union and John Wiley & Sons, Inc., ISBN 978-1-118-97870-2, 2016.

Prikryl, P., et al. (2016), GPS phase scintillation at high latitudes during the geomagnetic storm of 17–18 March 2015, *J. Geophys. Res. Space Physics*, 121, doi:10.1002/2016JA023171.

V. Sreeja (2016), Impact and mitigation of space weather effects on GNSS receiver performance, *Geoscience Letters*, doi: 10.1186/s40562-016-0057-0.

2017

- Cilliers, P., L. Alfonsi, L. Spogli, G. De Franceschi, V. Romano, I. Hunstad, N. Linty, O. Terzo, F. DAVIS, J. Ward, C. Cesaroni and J.A.E. Stephenson (2017), Analysis of the ionospheric scintillations during 20-21 January 2015 from SANAE by means of the DemoGRAPE scintillation receivers, Proceedings of URSI GASS, Montreal 19-26 August 2017, in publications on IEEE Xplore Summary Papers.
- Correia, E., L. Spogli, L. Alfonsi, C. Cesaroni, A. Gulisano, E. Thomas, R. Ramirez, and Alexandre Rodel. Ionospheric Response to the 26 September 2011 Geomagnetic Storm In Antarctica. *Annales Geophysicae*. 2017 Submitted
- Drews R., Pattyn F., Hewitt I. J., Matsuoka K., Helm V., Berger S., Bergeot N., Favier L., Actively evolving subglacial conduits and eskers initiate ice shelf channels at an Antarctic grounding line, *Nature Communications*, 8, 10.1038/ncomms15228, 2017.
- Giordanengo, G., L. Pilosu, L. Mossucca, F. Renga, S. Ciccina, O. Terzo, G. Vecchi, V. Romano, and I. Hunstad, "Energy Efficient System for Environment Observation", the 11th International Conference on Complex, Intelligent, and Software Intensive Systems - CISIS, 07/2017, accepted for publication.
- Mossucca, L., L. Pilosu, P. Ruiu, G. Giordanengo, S. Ciccina, G. Vecchi, O. Terzo, V. Romano, L. Spogli, C. Cesaroni, I. Hunstad, and A. Serratore, "Greenlab: autonomous low power system extending multi-constellation GNSS acquisition in Antarctica", Proceedings of URSI GASS, Montreal 19-26 August 2017, in publications on IEEE Xplore Summary Papers.
- Pattyn F., Bruyninx C., Tison J.-L., Bergeot N., Favier L., van Dam T., Drews R., Callens D., Philippe M., Matsuoka K. and Hubbard B., Constraining ice mass changes in coastal Dronning Maud Land, Antarctica (ICECON), final report Brussels : Belgian Science Policy 2009, 2017.
- Romero, R., N. Linty, C. Calogero, F. DAVIS and L. Alfonsi (2017, January), "On the Use and Performance of new Galileo signals for Ionospheric Scintillation Monitoring over Antarctica", Proceedings of ION ITM 2017, Monterey (CA), January 2017, pp.989-997, <https://www.ion.org/publications/abstract.cfm?articleID=14942>.

Presentations

- Bergeot N., Darrouzet F., Rasson J., Tsagouri I., Lichtenberger J., Marqué C., Chevalier J.-M., Martinez A., Katsiyannis T., Bruyninx C., Ranvier S., Lamy H., Tétard C., de Keyser J., Bracke S., Gonsette A. and Belehaki A., GNSS and Space Weather in East Antarctica around the Princess Elisabeth Belgian base, SCAR 2016 Conference, Kuala Lumpur, Malaysia, 20-30 August, 2016.
- Bruyninx C., Bergeot N., Van Dam T., Camelbeeck T., Francis O. and Tabibi S., High precision GNSS infrastructure around the Princess Elisabeth Base, BNCCG - BNCAR symposium, Brussels, Belgium, April 29, 2016.
- Capra A., A. Zanutta, M. Negusini, S. Gandolfi, F. Salvini, P. Sterzai, L. Vittuari, P. Cianfarra, M. Dubbini, A. Galeandro and F. Mancini, "VLNDEF: An integrated geodetic project and its latest results", poster presentation SCAR Open Science Conference, Kuala Lumpur, Malaysia, 22-26 August 2016.
- Chevalier J.-M., Bergeot N., Marqué C., Bruyninx C., Near-real time detection of solar radio burst impacting the GNSS signal reception, ESWW13, Oostende, Belgium, 14-18 November, 2016
- Drews R., Matsuoka K., Martin C., Callens D., Bergeot N. and Pattyn F., Evolution of Derwael Ice Rise in Dronning Maud Land, Antarctica, over the last millennia, BNCCG - BNCAR symposium, Brussels, Belgium, April 29, 2016.
- Drews R., Pattyn F., Berger S., Favier L., Matsuoka K. and Bergeot N., Ice-shelf channels: where they originate and how they evolve, BNCCG - BNCAR symposium, Brussels, Belgium, April 29, 2016
- Fernandez, José Henrique ; Correia, E. . Relationship between LEPE events in the lower ionosphere and the associated geospace conditions. In: VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016, Jatai. Anais do VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016

[SCAR SSG-Geosciences]: 2016-2017 Annual Report, cont.

- Francis O., Van Dam T., Bruyninx C., Bergeot N. and T. Camelbeeck, The GIANT project: why gravity is increasing at the PE station?, BNCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016.
- García-Rigo A., Roma-Dollase D., Hernández-Pajares M., Li Z., Terkildsen M., Olivares G., Ghoddousi-Fard R., Dettmering D., Erdogan E., Haralambous H., Béniguel Y., Berdermann J., Kriegel M., Krypiak-Gregorczyk A., Gulyaeva T., Komjathy A., Vergados P., Feltens J., Zandbergen R., Fuller-Rowell T., Altadill D., Bergeot N., Krankowski A., Agrotis L., Galkin I., Orus-Perez R., St. Patrick's Day 2015 geomagnetic storm analysis based on Real Time Ionosphere Monitoring, EGU General Assembly 2017, April 23-28, Vienna, Austria, 2017
- Heygster, G., C. Melsheimer, A. Gomes, G. Spreen, M. Negusini, B. H. Petkov and C. Tomasi, "Precipitable Water retrieval over Antarctica from Satellite Microwave Humidity sounders", XXXIInd URSI General Assembly and Scientific Symposium, 19 - 26 of August 2017, Montreal, Canada.
- Mossuca, L., L. Pilosu, P. Ruiu, G. Giordanengo, S. Ciccica, G. Vecchi, O. Terzo, V. Romano, L. Spogli, C. Cesaroni, I. Hunstad, and A. Serratore, "GreenLab: autonomous low power system extending multi-constellation GNSS acquisition in Antarctica", XXXIInd URSI General Assembly and Scientific Symposium, 19 - 26 of August 2017, Montreal, Canada.
- Pilosu, L., L. Mossuca, A. Scionti, G. Giordanengo, F. Renga, P. Ruiu, O. Terzo, S. Ciccica, and G. Vecchi, "Low Power Computing and Communication System for Critical Environments", 11-th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing - 3PGCIC 2016, Asan, Korea, 11/2016.
- Pilosu, L., P. Ruiu, A. Scionti, L. Alfonsi, L. Spogli, V. Romano, F. Dovis, N. Linty, P. Cilliers, P. Riley, J. Ward, E. Correia, J. Henrique, M. Bavaro, J. T. Curran, and J. Fortuny, "DemoGRAPE: A demonstrator of e-science potential in Antarctica", SCAR 2016, Kuala Lumpur, Malaysia, 08/2016.
- Pilosu, L., P. Ruiu, A. Scionti, L. Alfonsi, V. Romano, R. Romero, P. Cilliers, H. Theron, E. Correia, and W. Sarjob, "Cloud computing infrastructure for polar GNSS e-science applications", SCAR 2016, Kuala Lumpur, Malaysia, 08/2016.
- Prikryl, P., et al., GPS phase scintillation during the geomagnetic storm of March 17, 2015: The relation to auroral electrojet currents, Japan Geoscience Union Meeting, Makuhari Messe, Chiba-city, Japan, May 22-26, 2016.
- Prikryl, P., et al. (presented by Pierre Cilliers), GPS phase scintillation during the geomagnetic storm of March 17, 2015: Interhemispheric comparison and the relation to auroral electrojet currents, SCAR Open Science Conference, Kuala Lumpur, Malaysia, 22-26 August 2016.
- Prikryl, P., et al., Geomagnetic storms of March 17, 2013 and 2015: GPS phase scintillation and auroral electrojet currents, JpGU-AGU Joint Meeting 2017, Tokyo, Japan, 20–25 May 2017.
- Prikryl, P., et al., Comparison of March 2013 and 2015 storms : GPS phase scintillation and auroral electrojet currents, European Geosciences Union General Assembly 2017 Vienna, Austria, 23–28 April 2017.
- Prikryl, P., et al., GPS phase scintillation and auroral electrojet currents during geomagnetic storms of March 17, 2013 and 2015, XXXIInd URSI General Assembly and Scientific Symposium, 19 - 26 of August 2017, Montreal, Canada.
- Rodel, A. ; Correia, E. . Caracterização do comportamento da ionosfera durante eventos SFE 'Solar Flare Effect'. In: VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016, Jatai. Anais do VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016.
- Scarchilli, C., P. Grigioni, M. Maahn, M. Negusini, S. Argentini, G. Pace, M. Frezzotti, L. De Silvestri, V. Ciardini, A. Galeandro, A. Iaccarino, S. Dolci, M. Proposito, and G. Camporeale, "Solid precipitation estimation during summer snowfall events at a coastal site of the Terra Nova bay area, Antarctica", poster presented at European Geosciences Union General Assembly 2017 Vienna, Austria, 23–28 April 2017.
- Silva, G. A. ; Correia, E. ; A. Rodel . Variabilidade da espessura da ionosfera no setor equatorial americano. In: VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016, Jatai. Anais do VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016
- Tabibi S., Van Dam T., Francis O., Bruyninx C., Bergeot N. and Camelbeeck T., Snow accumulation retrieval in East Antarctica using GNSS-MR, BNCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016.

IBCSO

A new bathymetric map of the Drake Passage has been published in 2016:

Bohoyo, F., Larter, R.D., Galindo-Zaldívar, J., Leat, P.T., Maldonado, A., Tate, A.J., Gowland, E.J.M., Arndt, J.E., Dorschel, B., Kim, Y.D., Hong, J.K., Flexas, M., López-Martínez, J., Maestro, A., Bermudez, O., Nitsche, F.O., Livermore, R.A., Riley, T.R. 2016. Bathymetry and Geological Setting of the Drake Passage (1:1 500 000). BAS GEOMAP 2 Series, Sheet 7, British Antarctic Survey, Cambridge, UK.

If your Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

ADMAP

Links do not yet exist for ADMAP2 materials at the four data centres.

GEOMAP

Products, when ready, will certainly be made widely available.

GIANT

For Antarctic GNSS data refer especially to the “Database of the SCAR Epoch Crustal Movement Campaigns (short: SCAR GNSS Database), accessible at <https://data1.geo.tu-dresden.de/scar> .

GRAPE

GNSS-based (GPS+GLONASS) Total Electron Content data from POLENET, IGS networks, and Belgian stations from 1999 to 2016. The data were processed using the ROB-IONO software (Bergeot et al. 2014). Contact person Nicola Bergeot nicolas.bergeot@oma.be

Data from Ionosonde, GPS-TEC JAVAD, GNSS for TEC and scintillation, riometers, VLF for ionosphere monitoring at Brazilian Antarctic Station Comandante Ferraz (EACF 62.8S, 58.4W). GNSS for TEC and Scintillation, riometers and VLF at Radio Observatory of Itapetinga (ROI, 23.2S, 46.6W), GNSS for TEC and Scintillation and riometer at Cawame (Roraima-Brazil, 2.82N, 60.76W). Contact person: Emilia Correia ecorreia@craam.mackenzie.br

Eswua www.eswua.ingv.it (work in progress to upgrade the data base)
DemoGRAPE, GNSS data during DemoGRAPE campaigns, Contact person Lucilla Alfonsi lucilla.alfonsi@ingv.it

IBCSO

The new bathymetric map of the Drake Passage: can be downloaded here: <http://nora.nerc.ac.uk/515070/>

Budget

Planned use of funds for 2017 and 2018

ADMAP

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
12-17	AGU attendance support	2600	ADMAP	
03-18	Web-based costs- & staff time	2000	ADMAP	
04-18	EGU attendance support	1800	ADMAP	
06-18	SCAR-IASC attendance support	2000	ADMAP	
07-18	Early career visit VNIIO or BAS	1500	ADMAP	
11-18	Special Issue costs	2500	ADMAP	

ANTOS will discuss this at the SCAR Biology meeting in July 2017.

ANTPAS

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
October 2017	1 st Antpas Workshop Varese	7500	Mauro Guglielmin	Mauro.guglielmin@uninsubria.it
June 2018	IASC-SCAR Davos	3500	Mauro Guglielmin	Mauro.guglielmin@uninsubria.it

ANTVOLC

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
11-17	Workshop, Barcelona	3000	John Smellie	Jls55@le.ac.uk
06-18	SCAR OSC POLAR2018	3000	John Smellie	Jls55@le.ac.uk

GEOLOGICAL HERITAGE AND GEOCONSERVATION

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
Before Dec 2017	Possible travel to UK	\$1900 USD	Chris Carson	chris.carson@ga.gov.au
2018	Travel to Davos for XXXV SCAR	\$2000	Chris Carson	chris.carson@ga.gov.au

GEOMAP

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
<i>Dec 2016 Used leftover funding brought forward)</i>	<i>Student training and data capture</i>	<i>\$7000</i>	<i>Simon Cox</i>	<i>s.cox@gns.cri.nz</i>
12/2017	Student training & labour	\$3973	Simon Cox/Gianni Capponi	s.cox@gns.cri.nz
11/2018	Workshop of Action Group to review and harmonise data	\$4000	Simon Cox	s.cox@gns.cri.nz

GIANT

Month / Year	Purpose/Activity	Amount (US\$)	Contact Name	Contact Email
04/2017	International Workshop "Airborne Geodesy and Geophysics with Focus on Polar Applications"	1000	M. Scheinert	Mirko.Scheinert@tu-dresden.de
09/2017	International Workshop "Glacial Isostatic Adjustment and Elastic Deformation"	986	M. Scheinert	Mirko.Scheinert@tu-dresden.de
2018	2 nd SCAR Summer School on Polar Geodesy	5000	M. Scheinert	Mirko.Scheinert@tu-dresden.de
2018	Travel Support (e.g. for research stay of PhD / Postdoc)	2000	A. Capra, M. Scheinert, M. King	Alessandro.Capra@unimore.it

GRAPE

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
12-17	ionospheric monitoring meeting at the Royal Observatory of Belgium	1986 (Funds allocated in 2017)	Nicolas Bergeot	Nicola.bergeot@oma.be
3-18	SCAR 2018 registration fees for GRAPE attending people and support to early stage researchers	2000	G. De Franceschi	Giorgiana.defranceschi@ingv.it

IBCSO

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
06-18	POLAR 2018	2649	Jan Erik Arndt	Jan.Erik.Arndt@awi.de

Briefly describe what the funds will be used for and what the desired results are:

ADMAP

To support member(s) to attend at the AGU, EGU and SCAR meetings where ADMAP2 work will be presented to the scientific community.

ANTOS

Attendance by key individuals representing national programs to the Davos workshop is critical. Since ANTOS represents a significant long term investment from the National Programmes it is essential that we have significant buy-in from both researchers and COMNAP.

ANTPAS

The already planned 7500 euro for the organization of 1st Antpas Workshop Varese will be used mainly for giving grants to early or young researchers that will applied. A minor part could be used for the organization costs. The other money including the 1986 USD already available for 2017 and not spent and we are asking a little amount more (1514) in order to provide 5 grants of 500 USD (or 3 of 850 USD) for young and early researchers while 1000 USD will reserve for the Co-Chairs.

ANTVOLC

To pay local expenses and to offset travel costs of participants. Updates of current research and an outline roadmap.

GEOMAP

We wish during the austral summer 2017-18 to focus on data capture from East Antarctica, most probably with student(s) from Australia (University of Tasmania). \$3973 allocated for 2017 will be spent directly for capability development and training of students in GeoSciML, using their labour to help collate datasets for the project. GNS Science have recently been granted 4-star accreditation for their digital geological map web services (on OneGeology), and provide supervision, host visit and/or work virtually on datasets. In 2018 we aim to hold a workshop to harmonize geological legends and a seamless continent-wide dataset. This requires individual experts with experience, so only ~40% of requested 2018 budget would be allocated to early career scientists.

GEOLOGICAL HERITAGE AND GEOCONSERVATION

2017 - Possible use of Geo-heritage Action Group funds to offset travel costs to UK to visit to intensive workshop to finalise draft information. To be confirmed.

2018 – Request travel costs for SCAR XXXV Davos Switzerland for McLennan (early career researcher at Geoscience Australia, co-convener for geo-heritage session)

GIANT

Funding was requested in order to support the logistics of the workshop “Airborne Geodesy and Geophysics” held in Dresden, 2017. Participation of young scientists in "Glacial Isostatic Adjustment and Elastic Deformation" International Workshop and the 2nd SCAR Summer School on Polar Geodesy will be held in Ladojskoje Ozero, Russia (near St. Petersburg). Support for research stays, preferably of young scientists in the framework of the project GIANT-REGAIN.

GRAPE

Organization of a workshop on ionospheric monitoring and predictions at the Royal Observatory of Belgium. Registration fees and travel support for early stage researchers presenting a paper related to GRAPE.

IBCSO

Travel/subsidence/conference cost to POLAR 2018 in Davos, Switzerland to organize and participate in IBCSO kick-off Meeting and representation

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017: ANTPAS 90%
ANTVOLC 30%
GEOLOGICAL HERITAGE AND GEOCONSERVATION 0%
GEOMAP 100%
GIANT 70%
GRAPE 30%

2018: ADMAP 15%
ANTOS 25%
ANTPAS 70%
ANTVOLC 70%
GEOMAP 40%
GEOLOGICAL HERITAGE AND GEOCONSERVATION 50%
GIANT 80%
GRAPE 30%
IBCSO 100%

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

2017: ANTPAS 10%

2018: ANTOS 25%
ANTPAS 10%
GEOMAP 20%

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

ANTOS

NZARI – supported both co-chairs to attend the KL meeting. All committee members attending the past workshops have been supported by their respective national programmes or other national agencies. In addition, the workshop at the University of Waikato was supported directly by the University by providing the venue and food service.

ANTVOLC

International Association of Volcanology and Chemistry of the Earth's Interior.
<http://www.iavcei.org/>

ANTPAS

PNRA Italian national Program (4000 Euro for the organization of the 1st Antpas Workshop Varese)

GEOMAP

GeoMAP relies almost entirely on **co-funding** and voluntary efforts. We estimate the co-funding to total **~US\$150,000** per annum:

New Zealand's contribution led by GNS Science is based on US\$70k from Direct Core Funding, US \$20k from a Ross Sea Region (RSR) Terrestrial Data Analysis project (Landcare MBIE CO9X1413) and US\$7k NZ Antarctic Research Institute grant. Marie Byrd Land work completed by Colorado College was supported by a Witter Internship (~US\$10k).

At the time of writing we do not have detailed information on the funding utilized by Gianni Capponi (Italy), John Goodge and David Elliot (USA), Alex Burton-Johnston (UK), or Brett Kitchner and Matthew Cracknell (Australia). Paul Morin and the Polar Geospatial Centre are doing all sorts of other work in support of GeoMAP, providing datasets that we utilize.

GIANT

The International Workshop "Airborne Geodesy and Geophysics with Focus on Polar Applications", held in Dresden, Germany, 19-21 April 2017, was also supported by the Germany Research Foundation (DFG) and the German Society of Polar Research (DGP). The funding of DFG is not finalized yet, it will be in the order of 4000 to 5000 Euro. The DGP supported the workshop providing logistics for financial issues.

GRAPE

Italian National Program for Antarctic Researches (PNRA)

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

ANTPAS

Official cooperation: IPA International Permafrost Association; not official: IAG International Association of Geomorphology) and IUSS (International Union of Soils Science

GEOMAP

New Zealand Antarctic Research Institute
Polar Geospatial Centre (PGC), University of Minnesota

GIANT

SCAR Scientific Research Program SERCE
International Association of Geodesy (IAG), Subcommittee 1.3f "Reference Frame in Antarctica"
IAG Subcommittee 2.4f "Gravity and Geoid in Antarctica"

GRAPE

EU PROJECTS and initiatives focusing on GNSS services and Space Weather, URSI COMMISSIONS G and F, IAGA.

IBCSO

The IBCSO has strong collaboration to the General Bathymetric Chart of the Oceans (GEBCO), which operates under the joint auspices of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) (of UNESCO)

Outreach and Capacity Building

Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

ANTOS

Several activities, and it is remarkable the support for early career.

GEOMAP

GeoMAP was profiled in the SCAR March 2017 Newsletter and our pages on the SCAR website a reasonably up to date.

A series of presentations and posters were delivered at the SCAR 2016 conference, 2016 AGU Fall meeting and the 2017 NZ Antarctic Conference.

We have been using the same banner and logo for all posters and presentations, deliberately placing them together.

GIANT

Communication is being maintained through the SCAR GIANT website as well as through a GIANT mailing list that is open to all interested persons. There is a strong component for capacity building in supporting (master and PhD) students as well as PostDocs to participate in the planned summer school as well as in possible exchange at expert institutions.

GRAPE

Presentations:

Bergeot N., Why do we need to continue scientific research in Antarctica? Cognac Rotary Club, France, March 2, 2016 Presentation on Antarctica research at the Cognac Rotary Club.

Bergeot N., A little detour through Antarctica ? Berkendael prison, Belgium, May 26, 2017 Presentation in the frame of the "Clés pour l'Univers" association to give scientific presentation in closed institutions (here, prison for women).

Spogli Luca, "Space climate and space weather from the Arctic" lecture within the "Master in sustainable development, geopolitics of resources and arctic studies" organized by the Società Italiana per l'Organizzazione Internazionale (The Italian Society for International Organization), Rome July 2016.

IBCSO

As a regional mapping program of GEBCO, IBCSO is able to benefit from the large GEBCO network of ocean mappers and the growing number of GEBCO/Nippon Foundation scholars. The work of the IBCSO EG is regularly presented on conferences.

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

ANTOS

S. Craig Cary – caryc@waikato.ac.nz

Vonda Cummings - vonda.Cummings@niwa.co.nz

ANTPAS

Mauro Guglielmin mauro.guglielmin@uninsbria.it

Goncalo Vieira vieira@campus.ul.pt

ANTVOLC

Massimo Pompilio, INGV-Pisa, Italy, Massimo.pompilio@ingv.it

John Smellie, Leicester Univ, UK, jls55@le.ac.uk

Adelina Geyer, Barcelona, Spain, ageyer@ictja.csic.es

GEOLOGICAL HERITAGE AND GEOCONSERVATION

Chris Carson, chris.carson@ga.gov.au

GEOMAP

Simon Cox (s.cox@gns.cri.nz)

GIANT

Matt King (University of Tasmania, Hobart, Australia)

Matt.King@utas.edu.au

Mirko Scheinert (Dresden University of Technology, Germany)

Mirko.Scheinert@tu-dresden.de

René Forsberg (DTU Space, Copenhagen)

rf@space.dtu.dk

GRAPE

Nicolas Bergeot nicolas.bergeot@oma.be

Lucilla Alfonsi lucilla.alfonsi@ingv.it

IBCSO

Jan Erik Arndt (Jan.Erik.Arndt@awi.de)

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chief Officer	Jesús	Galindo-Zaldívar	Universidad de Granada	Spain	jgalindo@ugr.es	2016	
Deputy Chief Officer	Naresh C.	Pant	University of Delhi	India	pantnc@gmail.com	2016	
Secretary	Marcelo	Leppe	Instituto Antártico Chileno	Chile	mleppe@inach.cl	2016	

** Please include any APECS representative / Junior Officers*

Other members

First Name	Last Name	Affiliation	County	Email

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:

ANTOS

Help with establishing connections with COMNAP.

GEOMAP

Update webpages with posters and presentations from conferences.



SCAR Group

SG

Person

Responsible:

ADMAP

GS

xxx

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

ADMAP **2016-2017 Report**

Report Author(s):

Graeme Eagles, Detlef Damaske, Fausto Ferraccioli

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

ADMAP met twice in the period 2016-17, for a regular normal meeting at the SCAR meeting in Kuala Lumpur, August 2016, and as a splinter group at the European Geosciences Union meeting in Vienna, April 2017. Business at both meetings has centred on the final stages of preparation and publication of the second edition of the Antarctic Digital Magnetic Anomaly Map (ADMAP2) and database.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any):

We recommend that ADMAP continue as an expert group.

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

Over the last year the ADMAP2 grids and databases have been assembled as a base for dissemination to the community in 2017/18. ADMAP2 is a significant advance over the original ADMAP1 dataset: More than 2 million line-kilometers of new data are now incorporated. ADMAP2 will be available as grids as well as full databases of unprocessed, processed, and levelled data enabling users a much greater range of applications compared to ADMAP1. As agreed at the SCAR meeting in Kuala Lumpur, the databases and grids were completed in 2017. Full copies of the ADMAP2 download

materials were provided to members of the steering committee for formal evaluation in preparation for uploading to four separate data centres (BAS, KOPRI, NSIDC and PANGAEA).

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

The current stage of work involves quality control of the ADMAP2 databases in the proprietary Geosoft format. In coming months, ASCII versions of the databases will also be prepared to ensure readability in the future, and for users who are not Geosoft software licence holders. Members of ADMAP2 will also prepare a print version of the map for reproduction in a medium sized print run (~500 copies, costs to be borne by KOPRI). Also foreseen is an accompanying paper describing the datasets and the compilation details as well as highlighting implications for Antarctic geology and geophysics. Publication is envisaged in a high-profile international geoscientific journal. The databases and grids will be presented during the AGU Fall meeting in New Orleans, December 2017. The final release including the map and the accompanying paper is aimed for SCAR/IASC 2018.

We foresee a phase of intensive use of ADMAP2, with group members and the wider community working to extract scientific insights from the new dataset. As awareness of ADMAP2 grows, we will release the main ADMAP2 grid as a layer or component of data engines and larger databases such as Quantarctica and the World Digital Magnetic Anomaly Map (WDMAM). Beyond the ADMAP2 compilation, the group aims to discuss strategies for dealing with the ongoing stream of new magnetic anomaly data products from Antarctica. At present there are well over a quarter of a million line kilometres of yet-to-be-published data that are not included in ADMAP2. Future activity will focus on a new edition of ADMAP(2.1). Moving to rolling updates will enable us to be more in synch with the WDMAM community.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

2017

Jordan, T.A., Ferraccioli, F, and Leat, P.T. (2017), New geophysical compilations link crustal block motion to Jurassic extension and strike-slip faulting in the Weddell Sea Rift System of West Antarctica, *Gondwana Research* 42, 29-48.

2016

Maritati, A., A. R. A. Aitken, D. A. Young, J. L. Roberts, D. D. Blankenship, and M. J. Siegert (2016), The tectonic development and erosion of the Knox Subglacial Sedimentary Basin, East Antarctica, *Geophys. Res. Lett.*, 43, 10,728–10,737, doi:10.1002/2016GL071063

F. J. Davey, R Granot, S. C. Cande, J. M. Stock, M. Selvans, F. Ferraccioli, 2016. Synchronous Oceanic Spreading and Continental Rifting in West Antarctica. *Geophysical Research Letters*, DOI: 10.1002/2016GL069087.

ADMAP: 2016-2017 Annual Report, cont.

A. R. A. Aitken, J. L. Roberts, T. D. van Ommen, D. A. Young, N. R. Golledge, J. S. Greenbaum, D. D. Blankenship & M. J. Siegert, 2016. Repeated large-scale retreat and advance of Totten Glacier indicated by inland bed erosion. *Nature* 533,385-389, doi:10.1038/nature17447

A.R.A. Aitken, P.G. Betts, D.A. Young, D.D. Blankenship, J.L. Roberts, M.J. Siegert, 2016. The Australo-Antarctic Columbia to Gondwana transition. *Gondwana Research*, 29 (1), 136-152, doi:10.1016/j.gr.2014.10.019.

Frederick, B. C., Young, D. A., Blankenship, D. D., Richter, T. G., Kempf, S. D., Ferraccioli, F., and Siegert, M. J., 2016, Distribution of subglacial sediments across the Wilkes Subglacial Basin, East Antarctica, *Journal Of Geophysical Research: Earth Surface*, 121, 4, 790--813, 10.1002/2015JF003760

If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

Links do not yet exist for ADMAP2 materials at the four data centres.

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
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03-18	Web-based costs- & staff time	2000		
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07-18	Early career visit VNIIO or BAS	1500		
11-18	Special Issue costs	2500		

Briefly describe what the funds will be used for and what the desired results are:

To support member(s) to attend at the AGU, EGU and SCAR meetings where ADMAP2 work will be presented to the scientific community.

Provide an estimate on the % of the budget to be used for support of early career researchers:

ca 15% in 2018

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

No other formal support beyond that from KOPRI for the printed map.

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

Close collaboration and exchange with CGG (Combining Geology and Geophysics) group. Contact with WDMAM and Quantarctica.

Outreach and Capacity Building

Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

Outreach activities will be performed with the help of the British Antarctic Survey in particular following the publication of the new magnetic anomaly map for Antarctica and also the synthesis community-based publication.

An example of our capacity building includes support to Chinese geophysicists who will collect extensive new magnetic datasets after the completion of ADMAP2 and training and mentoring activities for early career scientist involved in ADMAP. In 2017 a Chinese PhD student was hosted at BAS under the supervision of Dr. Fausto Ferraccioli for 6 months.

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

Dr Fausto Ferraccioli BAS, UK, ffe@bas.ac.uk

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chair	Graeme	Eagles	AWI	Germany	Graeme.Eagles@awi.de	08/2016	
Co-chair	Detlef	Damaske		Germany	d.damaske@t-online.de	08/2016	
Co-chair	Fausto	Ferraccioli	BAS	UK	ffe@bas.ac.uk	08/2016	

** Please include any APECS representative / Junior Officers*

Other members

*The list includes current ADMAP Steering Committee members only (**Early Career members in bold**). A full list of international contributors to ADMAP can be provided on request.*

First Name	Last Name	Affiliation	County	Email
Alexander	Golynsky	VNIIO	Russia	sasha@vniio.nw.ru
Duncan	Young	UTIG	USA	duncan@ig.utexas.edu
Hyung Rae	Kim	KongjuUni	Korea	kimhr@kongju.ac.kr
Marta	Ghidella		Argentina	mghidella@gmail.com
Ralph	Von Frese	OSU	USA	von-frese.3@osu.edu
Antonia	Ruppel	BGR	Germany	antonia.ruppel@bgr.de
Dmitry	Golynski	VNIIO	Russia	dmitry.a.golynski@gmail.com

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:



SCAR Group

ANTPAS

SG

GS

Person
Responsible:

xxx

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

Antarctic Permafrost, Soils and Periglacial Environments (ANTPAS)

2016-2017 Report

Report Author(s):

Mauro Guglielmin – Goncalo Vieira

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

The main issue raised by ANTPAS community during the last year is that probably the scientific community related to permafrost and Antarctic periglacial areas is increased and always more interdisciplinary and therefore we decide to have the 1st International Workshop on Antarctic permafrost, periglacial processes and soils entitled : From an Expert Group to a Research Program that will held in Varese next 4-5 October to promote the beginning of a new SCAR Research Program. On the other hand the bipolar characteristics of the main part of our Expert Group members will maintain and therefore we propose two different bipolar sessions to the next SCAR-IASC Conference of Davos (2018). Finally, several people of our Group will be involved in some worldwide permafrost initiatives as the development of GTN-P (a synthesis paper will be submit soon) and the realization of the Globpermafrost Project including Antarctica.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

We think that EXCOM should promote more relations and interactions between Antera, Anteco, Antos and Antpas because they are working at least in part on integrable topics and issues and more synergy will be a benefit for everybody.

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

Two Antpas meeting held in 2016 at Potsdam (Germany) during the International Permafrost Conference (IPA) in June and afterwards on SCAR-OSC at Kuala Lumpur.

The group has been under a process of internal review in order to define the new science priorities. A questionnaire has been distributed to the members, with a first stage of discussion of results being made in the Potsdam meeting. Successively at KL the questionnaire results were reviewed and a number of measures were discussed and approved:

- Promoting advances and cooperation on permafrost, periglacial processes and soils research in the Antarctic and sub-Antarctic (e.g. Conference sessions, workshops, special issues on key topics, promote new projects).
- Providing expert advice on Antarctic permafrost and soils (e.g. SCAR, IPA, etc)
- Identifying key research topics and facilitate access to funding to members
- Promoting data standardization, archival and sharing (GTN-P, CALM)

It was also decided to make a call for action groups. Action groups should be group of limited duration targeting at specific tasks to be performed addressing at key topics in Antarctic permafrost research.

Actions for ongoing/urgent tasks, which should become implemented as action groups:

- ANTPAS communications (C. Hansen, F. Shanhun) ;
- State of the Antarctic active layer CALM paper to Polar Geography (M.A. de Pablo) ;
- ANTPAS Permafrost and soils monitoring network – linking with GTN-P and CALM (G.V ieira and M. Guglielmin);
- Permafrost map of the World (IPA) – follow up possible meeting in Sapporo 2017 (G. Vieira) ;
- Project Planning – ecosystem services in Antarctica (N. Cannone);
- Project planning – Brines/Mars environments (M. Guglielmin) ;
- Varese workshop (M. Guglielmin) ;
- Selection of SCAR Horizon Scan questions (B. Lyons) ;
- ANTPAS Terms of Reference (G. Vieira.).

Moreover it was decided to propose the 1st International Antpas Workshop entitled “From an Expert Group to a Research Program” on 4-5 October in Varese at Insubria University.

The Antpas website has been renewing and upgrading.

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

The 1st International Antpas Workshop entitled “From an Expert Group to a Research Program” will be held on 4-5 October in Varese at Insubria University. It will be the first step of the new future of Antpas as a Research

Program within SCAR. After the workshop during the next IASC-SCAR OSC at Davos in 2018 will be held two scientific sessions on permafrost in cooperation with IPA arctic colleagues and a new Antpas meeting in which will be discussed and decided if Antpas could begin a Research Program.

The possibility to organize a IPA Regional Permafrost Conference within in a country of the Southern Hemisphere managed by Antpas Committee is still under discussion. This could be a new occasion to strength the liason between IPA and SCAR and in this way attract also scientist that are not focused on Antarctica but that can have benefit to know our research progresses.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

A special issue related to the 1st International Antpas Workshop entitled "From an Expert Group to a Research Program" that will be held on 4-5 October in Varese has been proposed to different ISI Journals and is under evaluation.

A synthesis paper of GTN-P with large part of Antarctic permafrost temperature data has been finalizing.

If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
October 2017	1 st Antpas Workshop Varese	7500	Mauro Guglielmin	Mauro.guglielmin@uninsubria.it
June 2018	IASC-SCAR Davos	3500	Mauro Guglielmin	Mauro.guglielmin@uninsubria.it

Briefly describe what the funds will be used for and what the desired results are:

The already planned 7500 euro for the organization of 1st Antpas Workshop Varese will be used mainly for giving grants to early or young researchers that will be applied. A minor part could be used for the organization costs. The other money including the 1986 USD already available for 2017 and not spent and we are asking a little amount more (1514) in order to provide 5 grants of 500 USD (or 3 of 850 USD) for young and early researchers while 1000 USD will be reserved for the Co-Chairs.

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017:90%

2018:70%

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

2017: Hard to say but probably not more 10%

2018: 10%

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):
PNRA Italian national Program (4000 Euro for the organization of the 1st Antpas Workshop Varese)

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:
Official cooperation: IPA International Permafrost Association; not official: IAG International Association of Geomorphology) and IUSS (International Union of Soils Science)

Outreach and Capacity Building

Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

We have a mailing list of more than 100 people and many of us are part of the Cryolist. Moreover we are part of the GTN-P that is a world wide database of permafrost temperature.

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

Mauro Guglielmin mauro.guglielmin@uninsbria.it

Goncalo Vieira vieira@campus.ul.pt

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Start	Date
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ANTPAS: 2016-2017 Annual Report, cont.

e						ed	Ter m is to En d
Co Ch air	Maur o	Gugliel min	Insubri a Univer sity	Italy	Mauro.guglielmin@uni nsubria.it		
Co Ch air	Gonc alo	Vieira	Lisbon Univer sity	Portu gal	vieira@campus.ul.pt		

* Please include any APECS representative / Junior Officers

Other members

First Name	Last Name	Affiliation	County	Email

Too many to include in this table if you need I can provide separately a list of the members of ANTPAS

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:



SCAR Group

SG

Person

Responsible:

AntVolc

GS

xxx

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

AntVolc

Report Author(s): John Smellie (jls55@le.ac.uk)

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

- Membership has now reached 91 persons, up from 75 in 2016.
- A short progress-report AntVolc meeting was held at the SCAR OSC at Kuala Lumpur August 2016, together with a separate thematic session of scientific presentations.
- John Smellie took over from Massimo Pompilio as Chair after the SCAR OSC in Kuala Lumpur, with a term of office of 2 years.
- A dedicated AntVolc website has been released, hosted at the Institute of Earth Sciences Jaume Almera (ICTJA-CSIC) (<https://antvolcscar.wordpress.com/>).
- The principal deliverables for AntVolc have been defined together with a schedule for their completion.
- The second AntVolc workshop is scheduled for 22-24 November, at Barcelona.
- An AntVolc session dedicated to *bipolar* magmatic, tectonic & geodynamic investigations will take place at POLAR2018.
- The first major deliverable of AntVolc, a landmark review volume titled '*Volcanism in Antarctica: 200million years of subduction, rifting & continental break-up*' is now underway. It will be published as a Memoir of the Geological Society, London.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

None

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

See bullet points above

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

Continue with the writing and editing of a volume on Volcanism in Antarctica (to be published as a memoir of the Geological Society, London), with anticipated completion by end-2018 or early 2019.

To get underway by late 2018 a 'White Paper' for SCAR summarizing the state of research into Antarctic volcanism and provide a roadmap for future volcanic research.

Encourage parallel progress on a volume of tephra analyses for Antarctica.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

New AntVolc website (<https://antvolcscar.wordpress.com/>)

Scientific papers:

(late) 2015:

- Almendros, J., Carmona, E., Jiménez, V., Díaz, A., Lorenzo, F., Berrocoso, M., De Gil, A., Fernández-Ros, A. and Rosado, B. 2015. Deception Island: Sustained deformation and large increase in seismic activity during the 2014-2015 survey, in: Venzke, E (ed.), *Bulletin of the Global Volcanism Network*, 40:6, Smithsonian Institution.
- Del Carlo P., Di Roberto A., Di Vincenzo G., Bertagnini A., Landi P., Pompilio M., Colizza E., Giordano G. (2015). Late Pleistocene-Holocene volcanic activity in northern Victoria Land recorded in Ross Sea (Antarctica) marine sediments. *BULLETIN OF VOLCANOLOGY*, vol. 77, ISSN: 0258-8900, doi: [10.1007/s00445-015-0924-0](https://doi.org/10.1007/s00445-015-0924-0)
- Ilanko, T., Oppenheimer, C., Burgisser, A. & Kyle, P. 2015, Transient degassing events at the lava lake of Erebus volcano, Antarctica: Chemistry and mechanisms, *GeoResJ*, 7, 43–58.
- Ilanko, T., Oppenheimer, C., Burgisser, A. & Kyle, P. 2015. Cyclic degassing of Erebus volcano, Antarctica, *Bulletin of Volcanology*, 77: 56
- Jones, L. K., Kyle, P. R., Oppenheimer, C., Frechette, J. D., & Okal, M. H. (2015). Terrestrial laser scanning observations of geomorphic changes and varying lava lake levels at Erebus volcano, Antarctica. *Journal of Volcanology and Geothermal Research*, 295, 43-54.
- Le Losq, C., Neuville, D.R., Moretti, R., Kyle, P.R., and Oppenheimer, C. 2015, Rheology of phonolite magmas – the case of the Erebus lava lake, *Earth and Planetary Science Letters*, 411, 53–61.
- Martin, A.P.; Price, R.C.; Cooper, A.F.; McCammon, C.A. 2015. Petrogenesis of the rifted Southern Victoria Land lithospheric mantle, Antarctica, inferred from petrography, geochemistry, thermobarometry and oxybarometry of peridotite and pyroxenite xenoliths from the Mount Morning eruptive centre. *Journal of Petrology*, 56(1): 193-226.
- Martin, A.P., Cooper, A.F., Price, R.C., Turnbull, R.E. and Roberts, N.M.W. 2015 The petrology, geochronology and significance of Granite Harbour Intrusive Complex xenoliths

AntVolc: 2016-2017 Annual Report, cont.

- and outcrop sampled in western McMurdo Sound, Southern Victoria Land, Antarctica. *New Zealand Journal of Geology and Geophysics*, 58(1): 33-51.
- Molina, I., Burgisser, A., & Oppenheimer, C. 2015. A model of the geochemical and physical fluctuations of the lava lake at Erebus volcano, Antarctica. *Journal of Volcanology and Geothermal Research*, 308, 142-157.
- Padrón, E., Hernández, P. A., Carmona, E., Pérez, N., Melián, G., Sumino, H., Almendros, J., Kusakabe, M., Wakita, H., Padilla, G. 2015. Geochemical evidence of different sources of long-period seismic events at Deception volcano, South Shetland Islands, Antarctica, *Antarctic Science* 27, 557-565.
- Park, Y., Yoo, H.J., Lee, Ch-K., Lee, J., Park, H., Kim, J. and Kim, Y. 2015. P-wave velocity structure beneath Mt. Melbourne in northern Victoria Land, Antarctica: Evidence of partial melting and volcanic magma sources. *Earth & Planetary Science Letters*, 432, 293-299.
- Prudencio, J., De Siena, L., Ibáñez, J. M., Del Pezzo, E., Garcia-Yeguas, A. and Diaz-Moreno, A. 2015. The 3D attenuation structure of Deception Island (Antarctica), *Surveys in Geophysics*, 36, 371-390.
- Vignaroli G, Balsamo F, Giordano G, Rossetti F, Storti F (2015). Miocene-to-Quaternary oblique rifting signature in the Western Ross Sea from fault patterns in the McMurdo Volcanic Group, north Victoria Land, Antarctica. *TECTONOPHYSICS*, vol. 656, p. 74-90.

2016:

- Bahoyo, F., Larter, R.D., Galindo-Zaldivar, J., Leat, P.T., Maldonado, A., Tate, A.J., Gowland, E.J.M., Arndt J.E., Dorschel, B., Kim, Y.D., Hong, J.K., Flexas, M.M., López-Martinez, J., Maestro, A., Bermudez, O., Nitsche, F.O., Livermore, R.A. and Riley, T.R. 2016. Bathymetry and Geological Setting of the Drake Passage (1:1 500 000) BAS GEOMAP 2 Series (Sheet 7) British Antarctic Survey, Cambridge, UK.
- Iacovino, K., Oppenheimer, C., Scaillet, B., & Kyle, P. 2016. Storage and evolution of mafic and intermediate alkaline magmas beneath Ross Island, Antarctica. *Journal of Petrology*, 57, 93-118.
- Leat, P.T., Fretwell, P.T., Tate, A.J., Larter, R.D., Martin, T.J., Smellie, J.L., Jokat, W. and Bohrmann, G. 2016. Bathymetry and geological setting of the South Sandwich Islands volcanic arc. *Antarctic Science*, 28, 293-303.
- LeMasurier, W.E., Choi, S.H., Hart, S.R., Mukasa, S.B., Rogers, N.W., 2016. Reconciling the shadow of a subduction signature with rift geochemistry and tectonic environment in eastern Marie Byrd Land, Antarctica. *Lithos* 260, 134-153.
- Liu, E.J., Oliva, M., Antoniades, D., Giralt, S., Granados, I., Pla-Rabes, S., Toro, M. and Geyer, A., 2016. Expanding the tephrostratigraphical framework for the South Shetland Islands, Antarctica, by combining compositional and textural tephra characterisation. *Sedimentary Geology*, 340, pp.49-61.
- Narcisi, B., Petit, J.R., Langone, A. and Stenni, B. 2016. A new Eemian record of Antarctic tephra layers retrieved from the Talos Dome ice core (Northern Victoria Land). *Global and Planetary Change*, 137, 69–78.
- Oliva, M., Antoniades, D., Giralt, S., Granados, I., Pla-Rabes, S., Toro, M., Liu, E.J., Sanjurjo, J. and Vieira, G. 2016. The Holocene deglaciation of the Byers Peninsula (Livingston Island, Antarctica) based on the dating of lake sedimentary records. *Geomorphology*, 261, pp.89-102.
- Petit, J.R., Narcisi, B., Batanova, V.G., Savarino, J., Komorowsky, J.C., Michel, A., Metric, N., Besson, P., Vidal, C. and Alexander V. Sobolev. A.V. 2016. Identifying the AD 1257 Salamas volcanic event from micron-size tephra composition in two East Antarctic ice cores. *Geophysical Research Abstracts*, 18, EGU2016-5191.

2017:

AntVolc: 2016-2017 Annual Report, cont.

- Avery, M., Panter K.S., Gorsevski, P.V. (2017), Distinguishing styles of explosive eruptions at Erebus, Redoubt and Taupo volcanoes using multivariate analysis of ash morphometrics, *Journal Volcanology & Geothermal Research*, 10.1016/j.jvolgeores.2017.01.010
- Narcisi, B., Petit, J.R. and Langone, A. 2017. Last glacial tephra layers in the Talos Dome ice core (peripheral East Antarctic Plateau), with implications for chronostratigraphic correlations and regional volcanic history. *Quaternary Science Reviews*, 165, 111-126.
- Riley, T.R., Flowerdew, M.J., Pankhurst, R.J., Leat, P.T., Millar, I.L., Fanning, C.M. and Whitehouse, M.J. 2017. A revised geochronology of Thurston Island, West Antarctica, and correlations along the proto-Pacific margin of Gondwana. *Antarctic Science*, 29, 47-60.

Masters theses:

- Avery, Meredith. 2015. Multivariate Analysis of Volcanic Particle Morphology: Methodology and Application of a Quantitative System of Fragmentation Mechanism Classification. M.S. Thesis. Bowling Green State University, USA. 171 p.
- González Álvarez, I. N. 2016. Study of wave propagation anomalies at Deception Island volcano using numerical simulations and array techniques, MSc Thesis, Almendros, J. (advisor), MSc in Geophysics and Meteorology, University of Granada, Spain.
- Díaz Gato, D. 2016. Análisis de terremotos volcánicos de la isla Decepción (Antártida) con técnicas de array, MSc Thesis, Carmona, E. (advisor), MSc in Geophysics and Meteorology, University of Granada, Spain.
- Mead, S. 2016. Origin of sodic magma series: a comparative study of Deception Island, Antarctica, and Savo, Solomon Islands. MSc Thesis, University of Leicester, UK. [unpubl.]
- Redner, Ellen. 2016. Magma Mixing and Evolution at Minna Bluff, Antarctica Revealed by Amphibole and Clinopyroxene Analyses. M.S. Thesis. Bowling Green State University, USA. 214 p.

If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
11-17	Workshop, Barcelona	3000	John Smellie	Jls55@le.ac.uk
06-18	SCAR OSC POLAR2018	3000	John Smellie	Jls55@le.ac.uk

Briefly describe what the funds will be used for and what the desired results are:

To pay local expenses of hosting a workshop for AntVolc members at the Institute of Earth Sciences Jaume Almera (Spain) and to offset travel costs of participants. The workshop will provide (by means of scientific presentations) updates of current research into Antarctic volcanism, review progress in the Group and make plans for the coming 2-4 years, subject to Group discussions. An outline roadmap (like a mini 'horizon scan' for the Group) should be an

important outcome, including confirmation of major objectives, deliverables & timescales.

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017: 30%
2018: 70%

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

2017: none – no persons from the listed developing nations have joined the Group
2018: none currently identified

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

International Association of Volcanology and Chemistry of the Earth's Interior.
<http://www.iavcei.org/>
[formal link to be sought]

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

None at present

Outreach and Capacity Building

Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

AntVolc has continued to expand and now has a mailing list of members numbering 91 scientists.

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.

Massimo	Pompilio	INGV-Pisa	Italy	Massimo.pompilio@ingv.it
John	Smellie	Leicester Univ	UK	jls55@le.ac.uk
Adelina	Geyer	Barcelona	Spain	ageyer@ictja.csic.es

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chair	John	Smellie	Leicester	UK	jls55@le.ac.uk	September 2016	End-2018
Deputy Chair	Adelina	Geyer	Barcelona	Spain	ageyer@ictja.csic.es	September 2016	End-2018
Ex-officio	Massimo	Pompilio	Pisa	Italy	Massimo.pompilio@ingv.it		
Steering Group	Nelia	Dunbar	New Mexico Bureau of Geology	USA	Nelia@nmt.edu	September 2016	End-2018
Steering Group	Adam	Martin	GNS Science	New Zealand	A.Martin@gns.cri.nz	September 2016	End-2018
Steering Group	Kurt	Panter	Bowling Green State University	USA	kpanter@bgsu.edu	September 2016	End-2018
Steering Group	Don	Blankenship	UTexas at Austin	USA	blank@ig.utexas.edu	September 2016	End-2018
Steering Group	Jenn	Cooper	Cornell University	USA	Jrc323@cornell.edu	September 2016	End-2018

* Please include any APECS representative / Junior Officers

Other members

First Name	Last Name	Affiliation	County	Email
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Jim	Cole	Canterbury	New Zealand	Jim.cole@canterbury.ac.nz
Massimo	Coltorti	Ferrara	Italy	clt@unife.it
Paola	Del Carlo	INGV	Italy	Paola.delcarlo@ingv.it
Tom	Darrah	Ohio	USA	Darrah.24@osu.edu
Alessio	Di Roberto	INGV	Italy	Alessio.diroberto@ingv.it
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AntVolc: 2016-2017 Annual Report, cont.

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Jodi	Fox	Tasmania	Australia	jmf0x@utas.edu.au
Anne	Fulton	Pomona College	USA	Aaf02011@mymail.pomona.edu
Salvatore	Gambino	INGV	Italy	Salvatore.gambino@ingv.it
Maurizio	Gemelli	Pisa	Italy	gemelli@dst.unipi.it
Pier	Giacomoni	Ferrara	Italy	gcmppl@unife.it
Guido	Giordano	Rome	Italy	Guido.giordano@uniroma3.it
Gaetano	Giudice	INGV	Italy	Gaetano.giudice@ingv.it
Darren	Gravley	Canterbury	New Zealand	Darren.gravley@canterbury.ac.nz
Anne	Grunow	Ohio	USA	Grunow.1@osu.edu
Samuel	Hampton	Canterbury	New Zealand	Samuel.hampton@canterbury.ac.nz
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Maren	Kahl	Munich	Germany	Maren.kahl@min.uni-muenchen.de
Ben	Kennedy	Canterbury	New Zealand	Ben.kennedy@canterbury.ac.nz
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Yasmina	Martos	BAS	UK	yasmar@bas.ac.uk
Bill	McIntosh	New Mexico	USA	mcintosh@nmt.edu
Joan	Marti	Barcelona	Spain	Joan.marti@ija.csic.es
Yves	Moussallam	Cambridge	UK	Myvo90@gmail.com
Biancamaria	Narcisi	ENEA	Italy	Biancamaria.narcisi@enea.it
Clive	Oppenheimer	Cambridge	UK	Clive.oppenheimer@geog.cam.ac.uk
Naresh	Pant		India	pantnc@gmail.com
Yongcheol	Park	KOPRI	Korea	ypark@kopri.re.kr
Luis Miguel	Peci	Cadiz	Spain	Luismiguel.peci@uca.es
	Perinelli	Pisa	Italy	cperinelli@dst.unipi.it
Tanja	Petersen	GNS Science	New Zealand	T.Petersen@gns.cri.nz
Carlo	Prandi	Michigan Tech	USA	cmpandi@mtu.edu
Goni-alo	Prates	Algarve	Portugal	gprates@ualg.pt
Eugenio	Privitera	INGV	Italy	Eugenio.privitera@ingv.it
Enrica	Quartini	UTexas	USA	enrica@utexas.edu
Dan	Rasmussen	Lamont-Doherty	USA	danielr@ldeo.columbia.edu
Timothy	Raub	St Andrews	UK	timraub@st-andrews.ac.uk
Sergio	Rocchi	Pisa	Italy	rocchi@dst.unipi.it
Elise	Rumpf	Lamont-Doherty	USA	erumpf@ldeo.columbia.edu
Gilberto	Saccorotti	INGV	Italy	Gilberto.saccorotti@ingv.it
Giuseppi	Salerno	INGV	Italy	Giuseppi.salerno@ingv.it
Francesco	Santonocito		Italy	franksantonocito@gmail.com
Jane	Scarrow	Granada	Spain	jscarow@ugr.es
Christine	Siddoway	Colorado	USA	csiddoway@coloradocollege.edu
Letizia	Spampinato	INGV	Italy	Letizia.spampinato@ingv.it
Bryan	Storey	Canterbury	New Zealand	Bryan/storey@canterbury.ac.nz
Marco	Viccaro	Catania	Italy	m.vicarro@unict.it
Lothar	Viereck	Jena	Germany	Lothar.viereck@uni-jena.de
Thomas	Wilch	Albion	USA	twilch@albion.edu
Terry	Wilson	Ohio	USA	Wilson.43@osu.edu
Thomas	Wilson	Canterbury	New Zealand	Thomas.wilson@canterbury.ac.nz
Gerhard	Woerner	Gottingen	Germany	gwoerne@gwdg.de
Duncan	Young	UTexas	USA	duncan@ig.utexas.edu

Requests to the Secretariat:

AntVolc: 2016-2017 Annual Report, cont.

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:

Please ensure that a link is provided on the SCAR website to the AntVolc website (<https://antvolcscar.wordpress.com/>), if a link does not currently exist.



SCAR Group

Geoheritage

SG

GS

Person

xxx

Responsible:

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

ACTION GROUP on Geological Heritage and Geo-conservation

2016-2017 Report

Report Author(s):

Chris Carson, Australia, (Chair)

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

At the inaugural meeting of the Action Group on *Geological heritage and Geo-conservation* at XXXIV SCAR in Kuala Lumpur, the Action Group drafted an outline and key objectives of an information paper, to be delivered at the XLI ACTM. The information paper will address conservation strategies for Antarctic geological and geomorphological features (including fossils). The paper will form a basis on which SCAR will delivery advice on this matter to the Committee of Environmental Protection of the Antarctic Treaty.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

Nil to report

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

See summary of activities.

Related to the objectives of the Action group, we have been approached by the Chief Officer (SCAR Standing Committee on the Antarctic Treaty System) to consider a code of conduct would include advice relevant to geology, palaeontology, geomorphology and meteorite studies, particularly sampling protocols, with a delivery date for the Code of Conduct possibly in time for CEP 2019.

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

The Action Group primary objective is to deliver a document addressing conservation of Antarctic geological and geomorphological values (including fossils) to be used for SCAR's advice on this matter to the Committee of Environmental Protection of the Antarctic Treaty at the next XLI ATCM meeting, June 2018.

The focus of the next 6 months will be to finalise a draft information paper, to be circulated to members of the Action Group for input and comment for a final version to be submitted to SCAR Standing Committee on the Antarctic Treaty System (SCATS) for consideration in April 2018.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

Successful completion of the inaugural meeting of the Action Group on *Geological heritage and Geo-conservation* at XXXIV SCAR in Kuala Lumpur, agreed list of key objectives to address and consider in the ATCM information paper

Acceptance of a *Geological heritage and Geo-conservation* session at the XXXV SCAR to be held in Davos Switzerland June 2018.

Session will address Terms of References for the Action Group — “*Develop a strategy for global promotion geo-heritage values of the Antarctic through appropriate international forums*”

AG has been requested to provide an short editorial to *Antarctic Geoscience* journal on Geological heritage and geoconservation issues. Will be completed late July 2017.

If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

Nil to report at this stage

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
Before Dec 2017	Possible travel to UK	\$1900 USD	Chris Carson	chris.carson@ga.gov.au
2018	Travel to Davos for XXXV SCAR	\$2000	Chris Carson	chris.carson@ga.gov.au

Briefly describe what the funds will be used for and what the desired results are:

2017 - Possible use of Geo-heritage Action Group funds to offset travel costs to UK to visit to intensive workshop to finalise draft information. To be confirmed

2018 – Request travel costs for SCAR XXXV Davos Switzerland for McLennan (early career researcher at Geoscience Australia, co-convener for geo-heritage session)

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017: 0%
2018: 50%

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

2017: 0%
2018: 0%

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

The vast majority of financial support (salaries etc) comes from our employers and logistic support from our various national government Antarctic programs.

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

NIL to report

Outreach and Capacity Building

Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

Nil to report

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

Chris Carson, chris.carson@ga.gov.au

Membership

Leadership

Chris Carson, Australia, chris.carson@ga.gov.au (Chair)

Marcel Reguero, Argentina, mreguero@netverk.com.ar (co-Chair)

Kevin A. Hughes, UK, kehu@bas.ac.uk (Secretary)

Other members

ACTION GROUP members list

Anne Grunow, US, grunow.1@osu.edu

Berry Lyons, US, lyons.142@osu.edu

Carlo Baroni, Italy, carlo.baroni@unipi.it

Cliff Atkins, NZ, cliff.atkins@vuw.ac.nz

Jeronimo Lopez-Martinez, Spain, jeronimo.lopez@uam.es

Geoheritage: 2016-2017 Annual Report, cont.

John Smellie, UK, jls55@le.ac.uk

Läufer, Andreas, Germany, Andreas.Laeufer@bgr.de

Luis Carcavilla, Spain, l.carcavilla@igme.es

Marco Taviani, Italy, marco.taviana@bo.ismar.cnr.it

Phil O'Brien, Australia, phil.obrien.ant@gmail.com

ACTION GROUP community of interest

Evgeny Milhalsky, Russia, emikhalsky@vniio.nw.ru

Gary Wilson, NZ, gary.wilson@otago.ac.nz

Massimo Gasparon, Australia, m.gasparon@uq.edu.au

Rosaria Palmeri, Italy, rosaria.palmeri@unisi.it

Jesus Galindo-Zaldivar, Spain, jgalindo@ugr.es

Marc Oliva, Portugal, olive_marc@yahoo.com

Simon Cox, NZ s.cox@gns.cri.nz

Steph McLennan, Australia, stephanine.mclennan@ga.gov.au

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:



SCAR Group

SG

Person

Responsible:

GeoMAP

GS

Simon Cox

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

GeoMAP Action Group **2016-2017 Report**

Report Author(s): Dr Simon Cox, GNS Science, New Zealand

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

GeoMAP action group is collaboratively building a modern geological dataset to classify and describe the bedrock and surficial geology of Antarctica. It will depict 'known geology' of rock exposures rather than 'interpreted' sub-ice features, and is aimed towards continent-wide perspectives and cross-discipline interrogation. During 2016-2017 there was been significant progress in the digital capture of Marie Byrd Land, central Transantarctic Mountains, northern and southern Victoria Land, Dronning Maud Land and Antarctic Peninsula. SCAR funding enabled us to utilize of student labour, resulting in a major step forward, in turn providing training for early career scientists. About 75% of all the Antarctic rock outcrops now have some form of geological representation assigned to them suitable for use at 1:250,000 (or more-regional) scale (cf. 40% reported in 2016). Our second meeting was held at the SCAR 2016 conference and informal meetings completed by skype. We aim to have the first version of a continent-wide dataset ready for pre-release at Polar 2018 conference, but acknowledge this is an ambitious target.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any):

Please note significant progress towards a wonderful new dataset.
No major approvals needed (apart from confirmation of ongoing budget).

Progress and Plans:

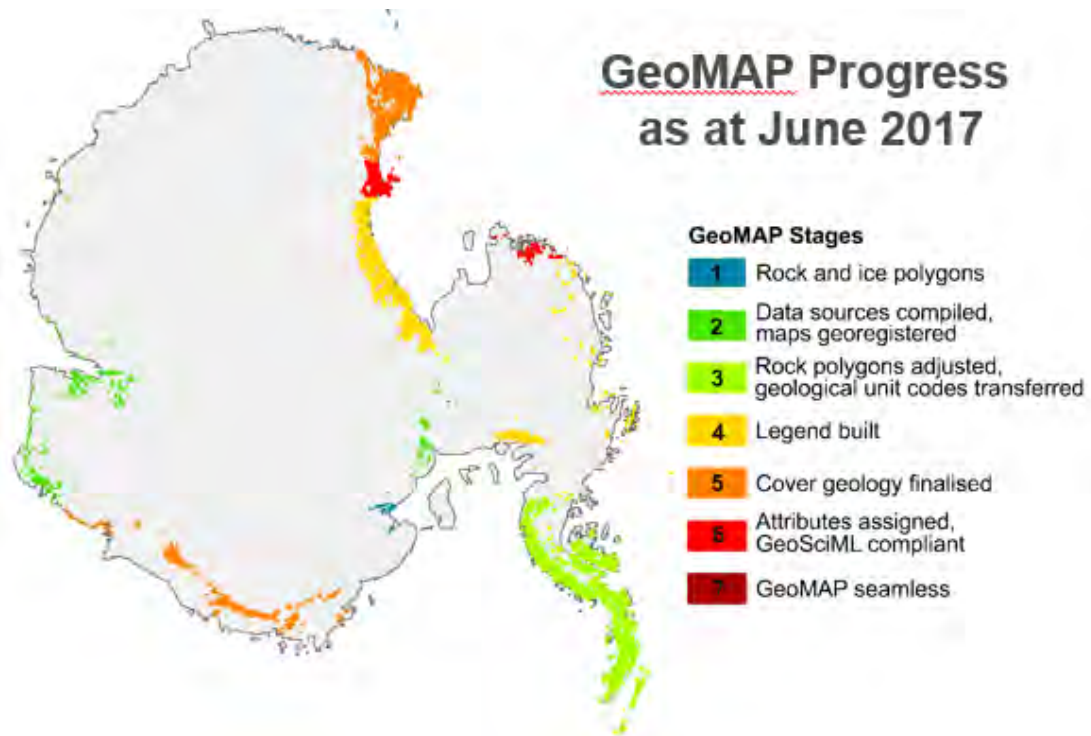
Major Activities and Significant Progress from the past year (<500 words):

GeoMAP's challenge is to collaboratively build a modern geological dataset that classifies and describes the bedrock and surficial geology of Antarctica's rock exposures – in practice this means classifying and describing around 72,000 distinct polygons that cover 51,000 km². We aim to use the international GeoSciML data format standard to turning available hard-copy maps into an easily accessible dataset that describes the exposed geosphere.

Progress during the past year includes:

- Two NZ students employed and trained in GIS & GeoMAP methods (Jasmine Mawson and Louis Whitburn). Collated data from northern Victoria land and central Transantarctic Mountains.
- One US student visited NZ on internship (Alexie Millikin). Collated Marie Byrd land and Ellsworth Mountains.
- One US student trained remotely and worked on volunteer basis (Tristan White). Worked on wMBL.
- One Australian student worked remotely (Brett Kitchener) on East Antarctic dataset.
- Second meeting held at the SCAR 2016 conference in Malaysia, with 23 participants representing 8 different nations.
- Newsletter produced.
- Website updated.
- Action group profiled in SCAR news.
- Posters presented at SCAR Conference (3), AGU (1), NZ Antarctic Conference (3). Convened special session on mapping at SCAR conference and have proposed a special session for Davos 2018.
- Eastern Marie Byrd Land captured and glacial geology updated.
- Northern Victoria Land glacial geology completed, polygons updated.
- central Transantarctic Mountains dataset basement geology completed.
- Ellsworth Mountains geology captured.
- Antarctic Peninsula dataset improved. Work in progress.
- Dronning Maud Land dataset completed by Norwegian Polar Institute.
- Australian maps of east Antarctica scanned & georeferenced, data captured over Bungor Hills, Larsemann Hills and Northern Vestfold Hills. Work in progress.
- First public showing of data in the Ross Sea Region presented at NZ Antarctic Conference.
- Dataset being used to develop models for forecasting meltwater.

A map showing our progress is provided below, colour-coded according to a 7 stage approach adopted:

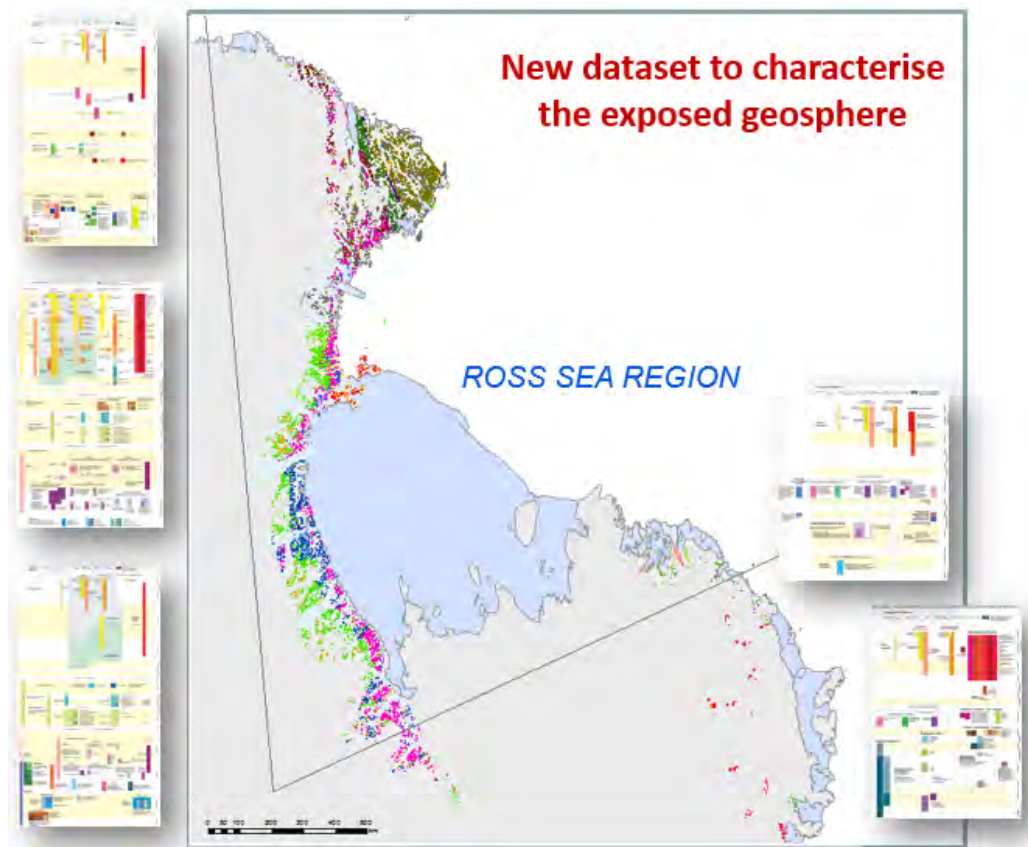


Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

July-Aug 2017	Complete capture of Peninsula geology. Finalise north Victoria Land glacial geology.
Aug-Jan 2017	Review cTAM glacial Geology. Improve definition of Ferrar-Beacon rocks.
Jan-May 2018	Integration of Norwegian Polar Institute data from Dronning Maud Land. Capture eastern Antarctic dataset.
June 2018	Next main meeting of GeoMAP (at Davos Polar 2018 conference). Possible first version release of the beta-version of dataset for peer review and discussion.
July-Nov 2018	Workshop of key action group members to review and harmonise seamless dataset.
Jan-Jun 2019	Finalise data into GeoSciML.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

A new dataset, illustrated below, is 90% complete for the Ross Sea Region. It is still a little premature to become a public product, requiring some harmonization between the different areas and their legends, but is already being sought and used for field planning and environmental domains analysis.



If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

GeoMAP products, when ready, will certainly be made widely available. That is our main purpose!

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
<i>Dec 2016 Used leftover funding brought forward)</i>	<i>Student training and data capture</i>	<i>\$7000</i>	<i>Simon Cox</i>	<i>s.cox@gns.cri.nz</i>
12/2017	Student training & labour	\$3973	Simon Cox/Gianni Capponi	s.cox@gns.cri.nz
11/2018	Workshop of Action Group to review and harmonise data	\$4000	Simon Cox	s.cox@gns.cri.nz

Briefly describe what the funds will be used for and what the desired results are:

GeoMAP relies mostly on the enthusiasm of members and co-funding, rather than direct funding from SCAR. We were extremely grateful access to leftover funding at the end 2016, which enabled us to employ student labour. This resulted in a large step forward in data captured. Note that our plan above is therefore lower than that requested at SCAR 2016.

We wish to use a similar work strategy during the austral summer 2017-18 to focus on data capture from East Antarctica, most probably with student(s) from Australia (University of Tasmania). \$3973 allocated for 2017 will be spent directly for capability development and training of students in GeoSciML, using their labour to help collate datasets for the project. GNS Science have recently been granted 4-star accreditation for their digital geological map web services (on OneGeology), and provide supervision, host visit and/or work virtually on datasets. In 2018 we aim to hold a workshop to harmonize geological legends and a seamless continent-wide dataset. This requires individual experts with experience, so only ~40% of requested 2018 budget would be allocated to early career scientists.

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017: 100% (students/interns and using them to help capture data in the GIS)
 2018: 40% (student labour & workshop)

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

2017: 100% Developed & Special Contributors/ 0% Developing

2018: 80% Developed & Special Contributors/ 20% Developing

At this stage there is no specific plan for involvement of countries with small or developing Antarctic programmes, but GeoMAP welcomes anyone who would like to contribute voluntary labour!

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

GeoMAP relies almost entirely on **co-funding** and voluntary efforts. We estimate the co-funding to total **~US\$150,000** per annum:

New Zealand's contribution led by GNS Science is based on US\$70k from Direct Core Funding, US \$20k from a Ross Sea Region (RSR) Terrestrial Data Analysis project (Landcare MBIE CO9X1413) and US\$7k NZ Antarctic Research Institute grant. Marie Byrd Land work completed by Colorado College was supported by a Witter Internship (~US\$10k).

At the time of writing we do not have detailed information on the funding utilized by Gianni Capponi (Italy), John Goodge and David Elliot (USA), Alex Burton-Johnston (UK), or Brett Kitchner and Matthew Cracknell (Australia). Paul Morin and the Polar Geospatial Centre are doing all sorts of other work in support of GeoMAP, providing datasets that we utilize.

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

New Zealand Antarctic Research Institute
Polar Geospatial Centre (PGC), University of Minnesota

Outreach and Capacity Building

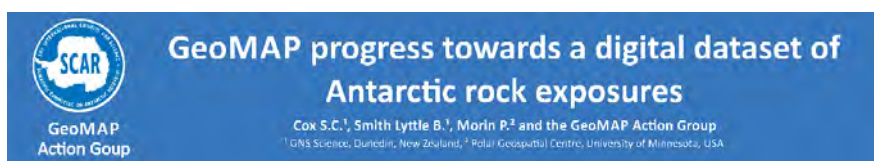
Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

GeoMAP Action Group: 2016-2017 Annual Report, cont.

Communication has generally been by way of group email (~half-yearly) and small skype meetings. **Our mailing list has 58 recipients representing 15 different nations.** We have held meetings once a year at conferences.

GeoMAP was profiled in the SCAR March 2017 Newsletter and our pages on the SCAR website a reasonably up to date.

A series of presentations and posters were delivered at the SCAR 2016 conference, 2016 AGU Fall meeting and the 2017 NZ Antarctic Conference. We have been using the same banner and logo for all posters and presentations, deliberately placing them together.



As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

Simon Cox (s.cox@gns.cri.nz)

Membership

Leadership

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chair	Simon	Cox	GNS Science	NZ	s.cox@gns.cri.nz	08/2015	2018
Chair	Paul	Morin	PGC	USA	lpaul@umn.edu	08/2015	2018

** Please include any APECS representative / Junior Officers*

Other members

First Name	Last Name	Affiliation	County	Email
Chris	Carson	Geoscience Australia	Australia	chris.carson@ga.gov.au
Laura	Crispini	University of Genova	Italy	crispini@dipteris.unige.it

GeoMAP Action Group: 2016-2017 Annual Report, cont.

Gianni	Capponi	University of Genova	Italy	capponi@dipteris.unige.it
Christine	Smith Siddoway	Colorado College	USA	CSiddoway@ColoradoCollege.edu
Burton-Johnson	Alex	British Antarctic Survey	UK	alerto@bas.ac.uk
Elliot	David	Ohio State University	USA	elliott.1@osu.edu
Synnøve	Elvevold	Norwegian Polar Institute	Norway	elvevold@npolar.no
Tamer	Abu-Alam	Norwegian Polar Institute	Norway	Tamer.Abu-Alam@npolar.no
Mark	Rattenbury	GNS Science	NZ	m.rattenbury@gns.cri.nz
Adam	Martin	GNS Science	NZ	a.martin@gns.cri.nz
Matthew	Cracknell	University of Tasmania	Australia	m.j.cracknell@utas.edu.au
Jacqueline	Halpin	University of Tasmania	Australia	jacqueline.halpin@utas.edu.au

Note: GeoMAP held its second formal meeting on at the SCAR 2016 conference in Kuala Lumpur. It was attended by 23 people, representing 8 different nations. Our mailing list has 58 recipients from 15 nations. The people listed above are a selection of those who have been more extensively involved in consultation and/or the first phases of work.

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:

It would be good to update our webpages with posters and presentations from conferences.



SCAR Group

EG GIANT

SG

GS

Person Responsible:

M. Scheinert,
A. Capra

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

Expert Group on “Geodetic Infrastructure in Antarctica” (GIANT)

Report Author(s):

Mirko Scheinert (Mirko.Scheinert@tu-dresden.de)

Alessandro Capra (Alessandro.Capra@unimore.it)

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

Geodetic GNSS measurements on bedrock are needed to determine vertical and horizontal deformations of the Earth's crust in order to provide in-situ information for the study of glacial-isostatic adjustment (GIA) and plate tectonics. Also during the Antarctic season 2016/2017 various GNSS measurements were carried out. New data – especially campaign-style GNSS data – are incorporated into the “SCAR GNSS Database” maintained at TU Dresden.

The new initiative “Geodynamics In ANTArctica based on REprocessing GNSS dAta Initiative” (GIANT-REGAIN) was launched in order to realize a major reprocessing of Antarctic GNSS data to infer a consistent set of coordinates and coordinate changes.

A gridded dataset of free-air gravity anomalies and Bouguer anomalies in Antarctica was published (Scheinert et al., GRL 2016). This publication was based on long-term activities of many participating national programs that worked together in different international multidisciplinary projects to gain gravity measurements in Antarctica.

An International Workshop “Airborne Geodesy and Geophysics with Focus on Polar Applications” was held in Dresden, Germany, 19-21 April 2017.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

Geodetic GNSS observations on bedrock in Antarctica are indispensable since they provide the only in-situ measurement of recent deformations of the Earth crust. Thus, these measurements are being used in manifold respects of Antarctic research. The scientific aspects are especially covered by the SCAR Scientific Research Program SERCE and the Expert Group GIANT.

Each of these geodetic GNSS measurements is essentially based on a stable marker that is directly connected to bedrock. Only in this way it can be ensured that exactly the same point is being occupied each time an observation is repeatedly carried out or realized in terms of a time series recording.

In view of funding issues and the environmental protection in Antarctica the question was raised whether these markers could be removed.

Together with the SCAR SRP SERCE Steering Committee we ask for a recommendation of the EXCOM that the geodetic markers on bedrock in Antarctica should be maintained in order to enable GNSS measurements being carried out at later times at exactly the same point.

(Contact to SCAR SRP SERCE: Pippa Whitehouse, Matt King, Terry Wilson).

Progress and Plans:

Major Activities and Significant Progress from the past year (<500 words):

Summary/Highlights

- Continuation of geodetic measurements in Antarctica, especially of geodetic GNSS to determine vertical and horizontal deformations of the Earth's crust;
- Relaunch of "SCAR GNSS Database" website and incorporation of new data through coordination with all participating national programs;
- Publication of gridded dataset of gravity anomalies for Antarctica (Scheinert et al., Geophysical Research Letters, 2016);
- Launch of "Geodynamics In ANTArctica based on REprocessing GNSS dAta Initiative"(GIANT-REGAIN)
- International Workshop "Airborne Geodesy and Geophysics with Focus on Polar Applications", Dresden, Germany, 19-21 April 2017.

It is a main task of the EG to foster the realization of geodetic measurements in Antarctica, especially of geodetic GNSS observations on bedrock. These GNSS measurements are needed to determine vertical and horizontal deformations of the Earth's crust in order to provide in-situ information especially for the study of glacial-isostatic adjustment (GIA) and plate tectonics. In that respect, various GNSS measurements were carried out during the 2016/2017 Antarctic season, according to the different national programs.

All new data – especially campaign-style GNSS data – are incorporated into the "SCAR GNSS Database" being relaunched and maintained at TU Dresden. This is being coordinated in close contact with the representatives of the national programs.

In terms of the regional gravity field, a gridded dataset of free-air gravity anomalies and Bouguer anomalies in Antarctica was published in the beginning of 2016 (Scheinert et al., Geophysical Research Letters, 2016). This publication based on long-term activities of many participating national programs that worked together in different international multidisciplinary projects to gain gravity measurements in Antarctica.

The new initiative "Geodynamics In ANTArctica based on REprocessing GNSS dAta Initiative" (GIANT-REGAIN) was launched in order to realize a major reprocessing of Antarctic GNSS data to infer a consistent set of coordinates and coordinate changes. The call was published by Matt King (Universi-

ty of Hobart, Australia) and Mirko Scheinert (TU Dresden) on occasion of the SCAR Meeting 2016 in Kuala Lumpur. The collection of data and metadata is still in progress.

The International Workshop “Airborne Geodesy and Geophysics with Focus on Polar Applications” was successfully held in Dresden, Germany, 19-21 April 2017. About 40 scientists from 6 countries discussed recent activities, accomplishments as well as challenges of airborne research in the polar regions, especially Antarctica. A summary report is to be published in EOS. The extended report is available at the website:

https://tu-dresden.de/bu/umwelt/geo/ipg/gef/forschung/geowissenschaften-auf-halo#ck_HALO_Box .

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years (<500 words):

The continuation of geodetic GNSS observations on bedrock is a major ongoing activity. It aids the observation of the changing dynamics of the Antarctic ice sheet, especially the study of glacial-isostatic adjustment. In terms of the changing ice sheet there is a strong monitoring aspect.

Timeline: Ongoing

M. King (University of Tasmania, Australia) and M. Scheinert (TU Dresden, Germany) launched “Geodynamics In ANTArctica based on REprocessing GNSS dAtA Initiative” (**GIANT-REGAIN**) with calls and deadline for data provision on 2016 and major processing activity in 2017/2018. Within this initiative we aim to offer research stay(s) in Hobart or in Dresden for early career scientists (PhD and Postdocs).

Timeline: 08/2016 – 06/2018

A 2nd “SCAR Summer School on Polar Geodesy” will be held in Ladojskoje Ozero, Russia (near St. Petersburg). SCAR funding is requested (through EG GIANT and SRP SERCE). It will be also supported by the Arctic-Antarctic Research Institute/Russian Antarctic Expedition (AARI/RAE) and the German Society of Polar Research (DGP e.V.).

Timeline: 10–19 May 2018

Members of EG GIANT are actively taking part in upcoming conferences, meetings and workshops. Here, we like to specially mention the International Workshop on "Glacial Isostatic Adjustment and Elastic Deformation" to be held in Reykjavik, Iceland, 5-7 September 2017, and the next SCAR Meeting in Davos, 2018.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

Scheinert, M.; Ferraccioli, F.; Schwabe, J.; Bell, R.; Studinger, M.; Damaske, D.; Jokat, W.; Aleshkova, N.; Jordan, T.; Leitchenkov, G.; Blankenship, D. D.; Damiani, T. M.; Young, D.; Cochran, J. R.; Richter, T. D. (2016): New Antarctic Gravity Anomaly Grid for Enhanced Geodetic and Geophysical

Studies in Antarctica. Geophysical Research Letters, 1944-8007, doi: 10.1002/2015GL067439

The datasets are published at <https://doi.org/10.1594/PANGAEA.848168>.

If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

For Antarctic GNSS data refer especially to the “Database of the SCAR Epoch Crustal Movement Campaigns (short: SCAR GNSS Database), accessible at <https://data1.geo.tu-dresden.de/scar> .

Budget

Planned use of funds for 2017 and 2018

Month / Year	Purpose/Activity	Amount (US\$)	Contact Name	Contact Email
04/2017	International Workshop “Airborne Geodesy and Geophysics with Focus on Polar Applications”	1000	M. Scheinert	Mirko.Scheinert@tu-dresden.de
09/2017	International Workshop "Glacial Isostatic Adjustment and Elastic Deformation"	986	M. Scheinert	Mirko.Scheinert@tu-dresden.de
2018	2 nd SCAR Summer School on Polar Geodesy	5000	M. Scheinert	Mirko.Scheinert@tu-dresden.de
2018	Travel Support (e.g. for research stay of PhD / Postdoc)	2000	A. Capra, M. Scheinert, M. King	Alessandro.Capra@unimore.it

Briefly describe what the funds will be used for and what the desired results are:

In 2017, the International Workshop on “Airborne Geodesy and Geophysics” was held in Dresden. Funding was requested in order to support the logistics of the workshop.

Also, for the International Workshop "Glacial Isostatic Adjustment and Elastic Deformation" funding shall be used to support the participation of young scientists.

The 2nd SCAR Summer School on Polar Geodesy will be held in Ladojskoje Ozero, Russia (near St. Petersburg). To support this summer school, especially the attendance of young scientists, we request a financial support of US\$ 5000.

In the framework of the project GIANT-REGAIN (see above) financial support is requested to support research stays, preferably of young scientists, at co-operating institutions that are active in geodetic research.

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017: 70%

2018: 80%

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions/>):

This depends on the applications (especially to attend at the workshop in Reykjavik, September 2017, and the 2nd SCAR Summer School on Polar Geodesy, Russia, May 2018).

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

The International Workshop “Airborne Geodesy and Geophysics with Focus on Polar Applications”, held in Dresden, Germany, 19-21 April 2017, was also supported by the Germany Research Foundation (DFG) and the German Society of Polar Research (DGP). The funding of DFG is not finalized yet, it will be in the order of 4000 to 5000 Euro. The DGP supported the workshop providing logistics for financial issues.

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

- SCAR Scientific Research Program SERCE
- International Association of Geodesy (IAG), Subcommission 1.3f “Reference Frame in Antarctica”
- IAG Subcommission 2.4f “Gravity and Geoid in Antarctica”

Outreach and Capacity Building

Please describe any outreach, communication and capacity building activities that your group participates in. Also provide information on activities that demonstrate effectiveness as a network. (coordinating activity for your discipline/topic, i.e. mailing list and diversity of scientists involved) (<250 words):

Communication is being maintained through the SCAR GIANT website as well as through a GIANT mailing list that is open to all interested persons. There is a strong component for capacity building in supporting (master and PhD) students as well as PostDocs to participate in the planned summer school as well as in possible exchange at expert institutions.

Also, we support capacity building when acting as a host for SCAR / COMNAP Fellowships.

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

Matt King (University of Tasmania, Hobart, Australia)

Matt.King@utas.edu.au

Mirko Scheinert (Dresden University of Technology, Germany)

Mirko.Scheinert@tu-dresden.de

René Forsberg (DTU Space, Copenhagen)

rf@space.dtu.dk

Membership

Leadership

* Please include any APECS representative / Junior Officers

Role	First Name, Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chair	Alessandro Capra	Universita di Modena e Reggio Emilia	Italy	Alessandro.Capra@unimore.it	2014	
Co-Chair	Mirko Scheinert	Technische Universität Dresden	Germany	Mirko.Scheinert@tu-dresden.de	2014	

Other members

First name	Last name	Affiliation	Country	Email
Manuel	Berrocoso	Universidad de Cadiz	Spain	manuel.berrocoso@uca.es
Graeme	Blick	LINZ	New Zealand	gblick@linz.govt.nz
Jan	Cisak	IGIK	Poland	jcisak@igik.edu.pl
Beata	Csatho	University of Buffalo	USA	bcsatho@buffalo.edu
John	Dawson	Geoscience Australia	Australia	john.dawson@ga.gov.au
Koishiro	Doi	National Institute of	Japan	doi@nipr.ac.jp

GIANT: 2016-2017 Annual Report, cont.

		Polar Research		
Rene	Forsberg	DTU Space	Denmark	rf@space.dtu.dk
Brendan	Hodge	UNAVCO	USA	hodge@unavco.org
Larry	Hothem	USGS	USA	ldhothem@gmail.com
Asparuh	Kamburov	University of Mining and Geology Sofia	Bulgaria	asparuh.kamburov@mgu.bg
Matt	King	University of Tasmania	Australia	Matt.King@utas.edu.au
Christoph	Knöfel	TU Dresden	Germany	Christoph.Knoefel@tu-dresden.de
Jeronimo	Lopez	Universidad Autonoma de Madrid	Spain	jeronimo.lopez@uam.es
Jaakko	Mäkinen	Finnish Geodetic Institute	Finland	jaakko.makinen@fgi.fi
Alexey	Matveev	Aerogeodeziya	Russia	matveev@agspb.ru
Gennadi	Milinevsky	University of Kyiv	Ukraine	gennadim@gmail.com
Markku	Poutanen	Finnish Geodetic Institute	Finland	Markku.Poutanen@fgi.fi
Goncalo	Prates	Univ. Algarve	Portugal	gprates@ualg.pt
Yves	Rogister	Univ. Strasbourg	France	Yves.Rogister@unistra.fr
Lars	Sjöberg	KTH Royal Institute of Technology	Sweden	lars.sjoberg@abe.kth.se
Norbertino	Suarez	Servicio Geografico Militar	Uruguay	norbertinosuarez@gmail.com
Andrés	Zakrajsek	Instituto Antartico Argentina	Argentina	afz@dna.gov.ar

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below:



SCAR Group

SG

Person
Responsible:

GRAPE

PS/GS

xxx

SCAR Executive Committee Meeting 2017

Brno, Czech Republic, 31 July - 2 Aug 2017

SCAR EG “GRAPE”
GNSS RESEARCH AND APPLICATION
TO POLAR ENVIRONMENT
2016-2017 Report

Report Author(s): Giorgiana De Franceschi, Nicolas Bergeot

Summary of activities from 2016-17 and any other important issues or factors (<150 words):

GRAPE is a joint Physical Sciences and Geosciences EG aiming to intensify the international efforts to build and coordinate a robust network of collaborations in order to answer a variety of weather and space weather related needs at high latitudes and polar regions (Arctic and Antarctica), through ad hoc data sharing and models development. The main outcome from the activities carried out relies on the increasing interest and participation of the international community to the scientific and business sessions organized within the International Beacon Satellite Symposium 2016 (26 June-1 July, Trieste, IT), the SCAR OSC 2016 (22-26 August, Kuala Lumpur) and the forthcoming URSI GASS 2017 (19-26 August, Montreal, CA) and IAGA 2017 (27 August- 1 September, Cape Town, SA) where a GRAPE mini symposium is planned to attract IAGA community and early stage researchers in South Africa.

Recommendations that EXCOM and Scientific Group Chief Officers should consider (if any): *Please indicate if approval is necessary or if they are just asked to note information.*

Progress and Plans:

Major Activities and Significant Progress from the past year

The observing infrastructures (mainly based on GNSS receivers able to monitor ionospheric TEC and scintillations), managed and upgraded by National Projects, is growing above all over Antarctica however not yet filling the existing gap between the Northern and Southern Hemispheres. New solutions for data exchange and management in a CLOUD environment addressed to Space Weather products development assisting communications, navigation and positioning are also in progress and tested in two Antarctic infrastructures (EACF, Brazil, SANAIV, South Africa), as well as the development of a novel GNSS software defined radio (SDR) receiver for ionospheric monitoring. URSI AT RASC in 2015 (16-24 May, Gran Canaria, Spain), where a GRAPE scientific session and business meeting were attended by a wide radio science community, has been crucial for the establishment of an international task force devoted to the implementation of a new Scientific Program proposal submitted in May 2017 to SCAR. The proposal, titled RESOURCE (Radio Sciences Research on AntarctiC AtmospherE) aims to improve the current monitoring and knowledge of the Antarctic atmosphere in relation to the Arctic environment in a bipolar framework, achieved using radio sensors and supported by complementary instrumentation. The main goal of the proposal, i.e. to isolate the atmospheric contribution and use it in the study of the near-earth space environment, will pursue the following open questions:

- The understanding of the coupling between the ionosphere and the neutral atmosphere in relation to the inter-hemispheric symmetries and asymmetries;
- The assessment of the impact of the polar atmosphere on the technology and on the humans at ground level or in the geospace environment;
- The investigation of the atmospheric waves and their role in the vertical coupling between the upper and lower atmosphere.

Major Future Initiatives and Actions, including rough timeline, for at least the next 2 years:

Efforts will be addressed to the activities proposed within RESOURCE, builded upon the important GRAPE legacy, firstly by enhancing interactions between the scientists who measure and utilise the entire radio spectrum, either as an auxiliary or principal observation, to study the atmosphere. Another important goal of the GRAPE-RESOURCE community will be the establishment of a closer link with the SAR community in respect to the past, contributing in mitigating the ionospheric effects on SAR images. Among conferences, a scientific session has been planned within SCAR OSC 2018 titled: The Polar Atmosphere and Geospace (Conveners: G. De Franceschi, Yasunobu Ogawa, Emilia Correia, Nicolas Bergeot) as well the GRAPE-

RESOURCE (hopefully) satellite meeting. Efforts of GRAPE participants will focus on a training course organized within the International School of Space Science (ISSS <http://www.cifs-iss.org/>) directed by U. Villante (University of L'Aquila). The course titled "The Polar Upper Atmosphere: from science to operational issues" is scheduled in September 2018 at L'Aquila (IT). The course, directed by G. De Franceschi (INGV), M. Mendillo (Boston University, USA), C. Mitchell (University of Bath, UK) aims to foster excitement and encourage involvement of the next generation of space researchers in studies of the geospace environment of Polar Regions.

Please list any new outputs and deliverables (including publications and products that your group feels are part of your achievements):

GRAPE WEB www.grape.scar.org (updating is in progress and a new version will be soon available).

Publications, Reports, Conferences Proceeding 2016-2017

- 2016

Alfonsi, L., Cilliers, P. J., Romano, V., Hunstad, I., Correia, E., Linty, N., ... & Riley, P. (2016). First observations of GNSS ionospheric scintillations from DemoGRAPE project. *Space Weather*, 14(10), 704-709, doi:10.1002/2016SW001488.

Correia, E., Quevedo, M.T. , Paz, A. J. . ANTARCTIC ATMOSPHERE RESPONSE TO THE SUN-EARTH INTERACTIONS. Annual Activity Report - INCT-APA, v. x, p. 15-22, 2016.

Linty, N., Romero, R., Cristodaro, C., Dovis, F., Bavaro, M., Curran, J. T., ... & Cilliers, P. (2016, May). Ionospheric scintillation threats to GNSS in polar regions: the DemoGRAPE case study in Antarctica. In *Navigation Conference (ENC), 2016 European* (pp. 1-7). IEEE. doi: [10.1109/EURONAV.2016.7530546](https://doi.org/10.1109/EURONAV.2016.7530546)

Linty, N., I. Hunstad, " Installation and configuration of an Ionospheric Scintillation Monitoring Station based on GNSS receivers in Antarctica. *RAPPORTI TECNICI INGV*, 2016, 354: 1-28. N

M. Negusini, B. H. Petkov, P. Sarti and C. Tomasi, (May 2016) "Ground-Based Water Vapor Retrieval in Antarctica: An Assessment," in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 54, no. 5, pp. 2935-2948,. doi: 10.1109/TGRS.2015.2509059.

Pignalberi, A ; Pezzopane, M ; Tozzi, R ; De Michelis, P; Coco, I: Comparison between IRI and preliminary Swarm Langmuir probe measurements during the St. Patrick storm period, *Earth, Planets and Space*, 68, 93, doi: 10.1186/s40623-016-0466-5, 2016.

Prikryl, P., Ghoddousi-Fard, R., Ruohoniemi, J. M., Thomas, E. G.: GPS phase scintillation at high latitudes during two geomagnetic storms, Auroral dynamics and space weather, Geophysical Monograph Series Vol. 215, Zhang, Y. and Paxton, L.J. (Editors), American Geophysical Union and John Wiley & Sons, Inc., ISBN 978-1-118-97870-2, 2016.

SCAR EG GRAPE: 2016-2017 Annual Report, cont.

Prikryl, P., et al. (2016), GPS phase scintillation at high latitudes during the geomagnetic storm of 17–18 March 2015, *J. Geophys. Res. Space Physics*, 121, doi:10.1002/2016JA023171.

V. Sreeja (2016), Impact and mitigation of space weather effects on GNSS receiver performance, *Geoscience Letters*, doi: 10.1186/s40562-016-0057-0.

- 2017

Cilliers, P., L. Alfonsi, L. Spogli, G. De Franceschi, V. Romano, I. Hunstad, N. Linty, O. Terzo, F. DAVIS, J. Ward, C. Cesaroni and J.A.E. Stephenson (2017), Analysis of the ionospheric scintillations during 20-21 January 2015 from SANAE by means of the DemoGRAPE scintillation receivers, Proceedings of URSI GASS, Montreal 19-26 August 2017, in publications on IEEE Xplore Summary Papers.

Correia, E., L. Spogli, L. Alfonsi, C. Cesaroni, A. Gulisano, E. Thomas, R. Ramirez, and Alexandre Rodel. Ionospheric Response to the 26 September 2011 Geomagnetic Storm In Antarctica. *Annales Geophysicae*. 2017 Submitted

Drews R., Pattyn F., Hewitt I. J., Matsuoka K., Helm V., Berger S., Bergeot N., Favier L., Actively evolving subglacial conduits and eskers initiate ice shelf channels at an Antarctic grounding line, *Nature Communications*, 8, 10.1038/ncomms15228, 2017.

G. Giordanengo, L. Pilosu, L. Mossucca, F. Renga, S. Ciccina, O. Terzo, G. Vecchi, V. Romano, and I. Hunstad, "Energy Efficient System for Environment Observation", the 11th International Conference on Complex, Intelligent, and Software Intensive Systems - CISIS, 07/2017, accepted for publication.

L. Mossucca, L. Pilosu, P. Ruiu, G. Giordanengo, S. Ciccina, G. Vecchi, O. Terzo, V. Romano, L. Spogli, C. Cesaroni, I. Hunstad, and A. Serratore, "Greenlab: autonomous low power system extending multi-constellation GNSS acquisition in Antarctica", Proceedings of URSI GASS, Montreal 19-26 August 2017, in publications on IEEE Xplore Summary Papers.

Pattyn F., Bruyninx C., Tison J.-L., Bergeot N., Favier L., van Dam T., Drews R., Callens D., Philippe M., Matsuoka K. and Hubbard B., Constraining ice mass changes in coastal draining Maud Land, Antarctica (ICECON), final report Brussels : Belgian Science Policy 2009, 2017.

R. Romero, N. Linty, C. Calogero, F. DAVIS and L. Alfonsi (2017, January), "On the Use and Performance of new Galileo signals for Ionospheric Scintillation Monitoring over Antarctica", Proceedings of ION ITM 2017, Monterey (CA), January 2017, pp.989-997, <https://www.ion.org/publications/abstract.cfm?articleID=14942>.

Presentations

Bergeot N., Darrouzet F., Rasson J., Tzagouri I., Lichtenberger J., Marqué C., Chevalier J.-M., Martinez A., Katsiyannis T., Bruyninx C., Ranvier S., Lamy H., Tétard C., de Keyser J., Bracke S., Gonsette A. and Belehaki A., GNSS and Space Weather in East Antarctica around the Princess Elisabeth Belgian base, SCAR 2016 Conference, Kuala Lumpur, Malaysia, 20-30 August, 2016.

SCAR EG GRAPE: 2016-2017 Annual Report, cont.

Bruyninx C., Bergeot N., Van Dam T., Camelbeeck T., Francis O. and Tabibi S., High precision GNSS infrastructure around the Princess Elisabeth Base, BNCCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016.

Capra A., A. Zanutta, M. Negusini, S. Gandolfi, F. Salvini, P. Sterzai, L. Vittuari, P. Cianfarra, M. Dubbini, A. Galeandro and F. Mancini, "VLNDEF: An integrated geodetic project and its latest results", poster presentation SCAR Open Science Conference, Kuala Lumpur, Malaysia, 22-26 August 2016.

Chevalier J.-M., Bergeot N., Marqué C., Bruyninx C., Near-real time detection of solar radio burst impacting the GNSS signal reception, ESWW13, Oostende, Belgium, 14-18 November, 2016

Drews R., Matsuoka K., Martin C., Callens D., Bergeot N. and Pattyn F., Evolution of Derwael Ice Rise in Dronning Maud Land, Antarctica, over the last millennia, BNCCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016.

Drews R., Pattyn F., Berger S., Favier L., Matsuoka K. and Bergeot N., Ice-shelf channels: where they originate and how they evolve, BNCCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016

Fernandez, José Henrique ; Correia, E. . Relationship between LEPE events in the lower ionosphere and the associated geospace conditions. In: VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016, Jataí. Anais do VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016

Francis O., Van Dam T., Bruyninx C., Bergeot N. and T. Camelbeeck, The GIANT project: why gravity is increasing at the PE station?, BNCCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016.

García-Rigo A., Roma-Dollase D., Hernández-Pajares M., Li Z., Terkildsen M., Olivares G., Ghoddousi-Fard R., Dettmering D., Erdogan E., Haralambous H., Béniguel Y., Berdermann J., Kriegel M., Krypiak-Gregorczyk A., Gulyaeva T., Komjathy A., Vergados P., Feltens J., Zandbergen R., Fuller-Rowell T., Altadill D., Bergeot N., Krankowski A., Agrotis L., Galkin I., Orus-Perez R., St. Patrick's Day 2015 geomagnetic storm analysis based on Real Time Ionosphere Monitoring, EGU General Assembly 2017, April 23-28, Vienna, Austria, 2017

G. Heygster, C. Melsheimer, A. Gomes, G. Spreen, M. Negusini, B. H. Petkov and C. Tomasi, "Precipitable Water retrieval over Antarctica from Satellite Microwave Humidity sounders", XXXIInd URSI General Assembly and Scientific Symposium, 19 - 26 of August 2017, Montreal, Canada.

L. Mossucca, L. Pilosu, P. Ruiu, G. Giordanengo, S. Ciccina, G. Vecchi, O. Terzo, V. Romano, L. Spogli, C. Cesaroni, I. Hunstad, and A. Serratore, "GreenLab: autonomous low power system extending multi-constellation GNSS acquisition in Antarctica", XXXIInd URSI General Assembly and Scientific Symposium, 19 - 26 of August 2017, Montreal, Canada.

L. Pilosu, L. Mossucca, A. Scionti, G. Giordanengo, F. Renga, P. Ruiu, O. Terzo, S. Ciccina, and G. Vecchi, "Low Power Computing and Communication System for Critical Environments", 11-th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing - 3PGCIC 2016, Asan, Korea, 11/2016.

SCAR EG GRAPE: 2016-2017 Annual Report, cont.

L. Pilosu, P. Ruiu, A. Scionti, L. Alfonsi, L. Spogli, V. Romano, F. Dovic, N. Linty, P. Cilliers, P. Riley, J. Ward, E. Correia, J. Henrique, M. Bavaro, J. T. Curran, and J. Fortuny, "DemoGRAPE: A demonstrator of e-science potential in Antarctica", SCAR 2016, Kuala Lumpur, Malaysia, 08/2016.

L. Pilosu, P. Ruiu, A. Scionti, L. Alfonsi, V. Romano, R. Romero, P. Cilliers, H. Theron, E. Correia, and W. Sarjob, "Cloud computing infrastructure for polar GNSS e-science applications", SCAR 2016, Kuala Lumpur, Malaysia, 08/2016.

Prikryl, P., et al., GPS phase scintillation during the geomagnetic storm of March 17, 2015: The relation to auroral electrojet currents, Japan Geoscience Union Meeting, Makuhari Messe, Chiba-city, Japan, May 22-26, 2016.

Prikryl, P., et al. (presented by Pierre Cilliers), GPS phase scintillation during the geomagnetic storm of March 17, 2015: Interhemispheric comparison and the relation to auroral electrojet currents, SCAR Open Science Conference, Kuala Lumpur, Malaysia, 22-26 August 2016.

Prikryl, P., et al., Geomagnetic storms of March 17, 2013 and 2015: GPS phase scintillation and auroral electrojet currents, JpGU-AGU Joint Meeting 2017, Tokyo, Japan, 20–25 May 2017.

Prikryl, P., et al., Comparison of March 2013 and 2015 storms : GPS phase scintillation and auroral electrojet currents, European Geosciences Union General Assembly 2017 Vienna, Austria, 23–28 April 2017.

Prikryl, P., et al., GPS phase scintillation and auroral electrojet currents during geomagnetic storms of March 17, 2013 and 2015, XXXIInd URSI General Assembly and Scientific Symposium, 19 - 26 of August 2017, Montreal, Canada.

Rodel, A. ; Correia, E. . Caracterização do comportamento da ionosfera durante eventos SFE 'Solar Flare Effect'. In: VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016, Jatai. Anais do VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016.

C. Scarchilli, P. Grigioni, M. Maahn, M. Negusini, S. Argentini, G. Pace, M. Frezzotti, L. De Silvestri, V. Ciardini, A. Galeandro, A. Iaccarino, S. Dolci, M. Proposito, and G. Camporeale, "Solid precipitation estimation during summer snowfall events at a coastal site of the Terra Nova bay area, Antarctica", poster presented at European Geosciences Union General Assembly 2017 Vienna, Austria, 23–28 April 2017.

Silva, G. A. ; Correia, E. ; A. Rodel . Variabilidade da espessura da ionosfera no setor equatorial americano. In: VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016, Jatai. Anais do VI Simpósio Brasileiro de Geofísica Espacial e Aeronomia, 2016

Tabibi S., Van Dam T., Francis O., Bruyninx C., Bergeot N. and Camelbeeck T., Snow accumulation retrieval in East Antarctica using GNSS-MR, BNCGG - BNCAR symposium, Brussels, Belgium, April 29, 2016.

If your Expert/Action Group produces data, please report any new data generated and links to inclusions to the Antarctic Master Directory, etc.

- GNSS-based (GPS+GLONASS) Total Electron Content data from POLENET, IGS networks, and Belgian stations from 1999 to 2016. The data were processed using the ROB-IONO software (Bergeot et al. 2014). Contact person Nicola Bergeot nicolas.bergeot@oma.be
- Data from Ionosonde, GPS-TEC JAVAD, GNSS for TEC and scintillation, riometers, VLF for ionosphere monitoring at Brazilian Antarctic Station Comandante Ferraz (EACF 62.8S, 58.4W). GNSS for TEC and Scintillation, riometers and VLF at Radio Observatory of Itapetinga (ROI, 23.2S, 46.6W), GNSS for TEC and Scintillation and riometer at Cawame (Roraima-Brazil, 2.82N, 60.76W). Contact person: Emilia Correia ecorreia@craam.mackenzie.br
- Eswua www.eswua.ingv.it (work in progress to upgrade the data base)
- DemoGRAPE, GNSS data during DemoGRAPE campaigns, Contact person Lucilla Alfonsi lucilla.alfonsi@ingv.it

Budget

Planned use of funds for 2017 and 2018

Month/Year (MM-YY)	Purpose/Activity	Amount (in USD)	Contact Name	Contact Email
12-17	ionospheric monitoring meeting at the Royal Observatory of Belgium	1986 (Funds allocated in 2017)	Nicolas Bergeot	Nicola.bergeot@oma.be
3-18	SCAR 2018 registration fees for GRAPE attending people and support to early stage researchers	2000	G. De Franceschi	Giorgiana.defranceschi@ingv.it

Briefly describe what the funds will be used for and what the desired results are:

Organization of a workshop on ionospheric monitoring and predictions at the Royal Observatory of Belgium. Registration fees and travel support for early stage researchers presenting a paper related to GRAPE.

All these initiatives aspire to disseminate the polar atmosphere and space weather, to coordinate international actions and efforts, and finally to attract as much as possible early stage researchers on these topics.

Provide an estimate on the % of the budget to be used for support of early career researchers:

2017: 30%

2018: 30%

Provide an estimate on the % of the budget to be used for support of scientists from countries with developing Antarctic programmes (as listed here: <http://www.scar.org/finances/contributions>):

We cannot provide an estimation today; it will depend on the adhesion of scientists from countries with developing Antarctic programmes, which are more than welcome.

2017:

2018:

Linkages

Please describe any direct support you receive for your activities beyond SCAR (eg. Funds from another organization for a workshop):

Italian National Program for Antarctic Researches (PNRA)

Please list any major collaborations your group has with other SCAR groups and with organisations/groups beyond SCAR:

EU PROJECTS and initiatives focusing on GNSS services and Space Weather, URSI COMMISSIONS G and F, IAGA.

Outreach and Capacity Building

Bergeot N., Why do we need to continue scientific research in Antarctica? Cognac Rotary Club, France, March 2, 2016 Presentation on Antarctica research at the Cognac Rotary Club.

Bergeot N., A little detour through Antarctica ? Berkendael prison, Belgium, May 26, 2017 Presentation in the frame of the "Clés pour l'Univers" association to give scientific presentation in closed institutions (here, prison for women).

Spogli Luca, "Space climate and space weather from the Arctic" lecture within the "Master in sustainable development, geopolitics of resources and arctic studies" organized by the Società Italiana per l'Organizzazione Internazionale (The Italian Society for International Organization), Rome July 2016.

ACTIONS

As part of SCAR's Capacity Building efforts, such as the Fellowships and Visiting Professor Awards, we are looking for people from all the SCAR groups to form a 'review panel' so if applications in your field are submitted we have people to contact to help assess relevant applications. **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.**

Nicolas Bergeot
nicolas.bergeot@oma.be

Lucilla Alfonsi
lucilla.alfonsi@ingv.it

Membership

The complete list of membership is available at www.grape.scar.org
Leadership

SCAR EG GRAPE: 2016-2017 Annual Report, cont.

Role	First Name	Last Name	Affiliation	Country	Email	Date Started	Date Term is to End
Chief officer	Giorgiana	De Franceschi	INGV	Italy	Giorgiana.defranceschi@ingv.it	August 2012	
Deputy chief officer	Nicolas	Bergeot	OMA	Belgium	nicolas.bergeot@oma.be	August 2016	

** Please include any APECS representative / Junior Officers*

Other members

First Name	Last Name	Affiliation	County	Email

Requests to the Secretariat:

If there are specific administrative tasks you would like help with such as your webpages, mailing list, online meeting tools, etc., please include them below: