



WP **15a**
Agenda Item: 4.2.7
Person Responsible: T. Wilson

**XXXIV SCAR Delegates Meeting
Kuala Lumpur, Malaysia, 29-30 August 2016**

Solid Earth Response and influence on Cryospheric Evolution



Scientific Research Programme

Executive Summary

Authors: Terry Wilson

Important Issues or Factors:

Advances in planning for future SERCE workshops and training schools, for new interdisciplinary partnerships to address key Horizon Scan questions, and new SERCE leadership are outlined here, updating the 2016 SERCE SRP Review and Review Response documents.

Recommendations/Actions and Justification:

Please note update from SERCE Review Document. Request approval of leadership change and approval of budget requests.

Budget Implications:

SERCE requests that \$21,500 dollars from 2016 be carried forward to 2017 to support the Cryoseismology Training School scheduled for June, 2017; for 2017, requested budget allocation of \$21,000 to the training school (\$5,000) and for early-career participant support for the SERCE/IAG Workshop on Glacial Isostatic Adjustment & Elastic Deformation (\$16,000).

SERCE Overview

The *Solid Earth Response and influence on Cryospheric Evolution* (SERCE) scientific research programme aims to *advance understanding of the interactions between the solid earth and the cryosphere to better constrain ice mass balance, ice dynamics and sea level change in a warming world*. This overarching objective is being addressed through integrated analysis and incorporation of geological, geodetic and geophysical measurements into models of glacial isostatic adjustment (GIA) and ice sheet dynamics. The programme is designed to synthesize and integrate the extensive new geological and geophysical data sets obtained during and subsequent to the International Polar Year with modeling studies, in a timeframe to contribute to IPCC AR6. SERCE aims to provide the international collaborative framework and scientific leadership to investigate systems-scale solid earth – ice sheet interactions across Antarctica and relate these results to global earth system and geodynamic processes.

Progress to Date

The SERCE 2016 External Review Document provides details on the SRP activities. In the last 2 years, 6 symposia, 2 workshops and a major 5-day training school were planned and implemented by the SERCE group and collaborators. The Glacial Isostatic Training School had 45 on-site participants from 16 nations and 31 virtual participants from 8 additional countries and videos of all lectures are available for online viewing. Over 99% of SERCE funding has been expended on support for student/early career participation in these activities.

Science output on a variety of themes central to the SERCE SRP has been extensive. Highlights include improved models of glacial isostatic adjustment for Antarctica, estimates of Antarctic ice mass balance with significantly reduced uncertainties, advances in mapping spatial variations in deep earth structure of the continent, discovery of active subglacial magmatism, and insights into interactions between the solid earth and ice dynamic processes.

The SERCE SRP received very positive external reviews. As outlined in the SERCE 'Response' document to the reviews, suggestions and issues identified by the review process will be discussed at the SERCE business meeting in Kuala Lumpur and addressed in future activities. After the SCAR Business meetings at 34 SCAR, the leadership of the SERCE SRP will rotate from Terry Wilson (USA) to co-chief officers Matt King (Australia) and Pippa Whitehouse (UK). Rotation of Steering Committee members will be confirmed at the Business Meeting.

Future Plans

The *Cryo-Seismology Training School* plans have progressed substantially. The School is planned for June, 2017 in Fort Collins, Colorado, USA. Instructors have been identified and a draft agenda for the 5-day course has been developed. Advertising for the course will begin in December 2016, applications will be due in February, 2017. The School is co-sponsored by the POLENET-ANET project funded by the U.S. National Science Foundation Polar Programs.

Planning for the workshop on *Glacial Isostatic Adjustment & Elastic Deformation* has also advanced. A venue for the workshop, which is jointly sponsored by SERCE and the Intl Association of Geodesy Subcommission 3.4 – Cryospheric Deformation has been organized in Reykjavik, Iceland, for September 5-7, 2017. is being planned for 2017. The focus of the workshop will be on establishing robust methods to separate components of crustal motions measured by geodetic methods due to various drivers, including elastic rebound due to modern ice mass change, viscoelastic rebound due to ancient ice mass change, and tectonics.

The SERCE SRP will discuss future symposia and workshops partnering with other international science organizations (e.g. WCRP) to map new cross-disciplinary approaches to several SCAR Horizon Scan top questions at business meetings in Kuala Lumpur.