

## Your abstract submission has been received

Click [HERE](#) to print this page now.

**You have submitted the following abstract to 2016 AGU Fall Meeting. Receipt of this notice does not guarantee that your submission was complete or free of errors.**

---

### **Ross Ice Shelf, Antarctica: Bathymetry, Structural Geology and Ocean Circulation from New IcePod Airborne Geophysical Data**

---

**Christine S Siddoway**, Colorado College, Colorado Springs, CO, United States, Kirsty J Tinto, Columbia University, Palisades, NY, United States, Robin Elizabeth Bell, Lamont -Doherty Earth Observatory, Palisades, NY, United States, Laurence Padman, Earth & Space Research, Corvallis, OR, United States, Helen Amanda Fricker, Scripps Institution of Oceanography, La Jolla, CA, United States and Scott R Springer, Earth and Space Research, Seattle, WA, United States

#### **Abstract Text:**

Rock exposures in the Ford Ranges, Marie Byrd Land (MBL), on the eastern margin of the Ross Embayment, contain direct evidence of the geological processes that led to formation of West Antarctica's continental lithosphere. Processes include wide regional extension, volcanism, and thermal reequilibration, with creation of crustal structures that are prone to reactivation today. Marie Byrd Land is tectonically active, as is evident from Late Pleistocene to Holocene eruptive centers, englacial volcanic tephra as young as 2200 years, a site of magma propagation inferred from POLEnet seismic records, and the occurrence of a 2012 earthquake cluster of magnitude M4.4 to M5.5 north of Edward VII Peninsula. However, the lithosphere underlying the Ross Ice Shelf (RIS) is poorly known due to the thick cover of shelf ice floating on the ocean, difficult to penetrate by satellite remote sensing or other methods. Airborne geophysical data for the Ford Ranges and the Ross Ice Shelf (RIS) suggest that the rock formations and structures that underlie MBL continue beneath the RIS. Notable features known in outcrop and detected/inferred from potential fields data are Pleistocene or younger mafic volcanic centers and Cretaceous core complexes, both likely associated with wrench faults. The Ford Ranges legacy dataset that now provides a fundamental basis for sub-RIS geological interpretation is a product of research in coastal MBL led by B.P. Luyendyk from 1989 – 2006.

To improve our knowledge of lithospheric evolution, identify active faults and prospective zones of volcanism/heat flow, and to determine the sub-RIS bathymetry, the RIS sector is being explored via new Icepod aerogeophysics acquisition during the ROSETTA-Ice project (Ross Ocean and ice Shelf Environment, and Tectonic setting Through Aerogeophysical surveys and modeling), now underway over this vast under-explored sector of the Ross Embayment. ROSETTA-Ice collects and employs new gravity data with magnetics to delineate sediments, bedrock geological units, and faults beneath the RIS, then model bathymetry. This poster will share preliminary results and interpretations. The improved characterization of the subglacial geology and bathymetry will aid in refinement of the tectonic framework and models of oceanographic circulation, with bearing on RIS stability.

**Topic Selection:** Tectonic, glacial, and ocean influences on bed geology and paleoelevation through time, Ross Embayment, West Antarctica

**Submitter's E-mail Address:** csiddoway@coloradocollege.edu

**Abstract Title:** Ross Ice Shelf, Antarctica: Bathymetry, Structural Geology and Ocean Circulation from New IcePod Airborne Geophysical Data

**Requested Presentation Type:** Assigned by Program Committee (oral, panel, poster, or lightning poster talk)

**Previously Published?:** No

**AGU On-Demand:** Yes

**Abstract Payment:** Paid (agu-fm16-143341-0048-4465-0477-3316)

*I do not want to be involved in OSPA or the Mentoring program.*

**Scientific Team:** ROSETTA-Ice Team

First Presenting Author

---

***Presenting Author***

---

Christine S Siddoway

**Primary Email:** csiddoway@coloradocollege.edu

**Phone:** 7193896717

**Affiliation(s):**

Colorado College  
Colorado Springs CO 80903 (United States)

Second Author

---

Kirsty J Tinto

**Primary Email:** tinto@ldeo.columbia.edu

**Affiliation(s):**

Columbia University  
Palisades NY 10964-8000 (United States)

Third Author

---

Robin Elizabeth Bell

**Primary Email:** robinb@ldeo.columbia.edu

**Phone:** 8453658827

**Affiliation(s):**

Lamont -Doherty Earth Observatory  
Palisades NY (United States)

Fourth Author