Terr. Atmos. Ocean. Sci., Vol. 24, No. 4, Part I, I, August 2013 doi: 10.3319/TAO.2013.04.17.01(TibXS)

Preface to the Special Issue on "Geophysical and Climate Change Studies in Tibet, Xinjiang, and Siberia (TibXS) from Satellite Geodesy"

Cheinway Hwang, Kosuke Heki, Wenbin Shen, and C. K. Shum

Citation: Hwang, C., K. Heki, W. Shen, and C. K. Shum, 2013: Preface to the special issue on "geophysical and climate change studies in Tibet, Xinjiang, and Siberia (TibXS) from satellite geodesy." Terr. Atmos. Ocean. Sci., 24, I, doi: 10.3319/TAO.2013.04.17.01(TibXS)

This special issue publishes papers on recent results in geophysical and climate change studies over Tibet, Xinjiang and Siberia (TibXS) based upon some of the key sensors used in satellite geodesy, including satellite gravimetric sensors (GRACE and GOCE), satellite altimeters (TOPEX, Jason-1 and -2, and ENVISAT), and Global Positioning System satellites. Results from ground- and airborne-based geodetic observations, notably those based on airborne gravimeter, superconducting gravimeter (SG) and seismometers are also included in the special issue. In all, 22 papers were submitted for this special issue; 17 papers were accepted. Early versions of some of the accepted papers were presented at the 2nd International Workshop on Multi-observations and interpretations of Tibet, Xinjiang and Siberia (TibXS 2011), held in Xining, Qinghai, China, 22-26 July 2011 (http://www.sgg.whu.edu.cn/tibxs and http://space.cv.nctu.edu.tw/altimetryworkshop/TibXS2011/TibXS2011.htm).

The topics of the accepted papers are rather diversified, but are consistent with the themes proposed in the special issue. In fact, teleconnections are common in climate-related events: one phenomenon occurring at one space or time may be the cause or consequence of another phenomenon occurring at another space and time. Selected highlights presented in this special issue are:

(1) An updated Moho depth model and a new geoid model over Tibet from recent GRACE/GOCE gravity models and CRUST2.0 crust model.
(2) Improved methods for retracking altimeter waveforms and an improved method of lake level determination and prediction; TibXS hydrology variability and climate variability from height and backscatter observations of TOPEX.
(3) Crustal movements in China and tsunami simulations related to the Tohoku-Oki earthquake of March 11, 2011, Japan.
(4) Changes in ice mass and in seasonal ocean tide over arctic islands and subarctic oceans (near Siberia) from GRACE and satellite altimetry.
(5) A distinct crustal structure of Tibet compared to PREM, using GOCE and GPS data.
(6) A new SG was installed at Lhasa, Tibet. The preliminary results reported in this special issue both contrast or confirm the model predictions, depending on the topics. A long-term SG record here is needed to enhance the current measurements of tidal amplitude factors and the SG calibration function.

Due to the vast area and the remoteness of TibXS, in situ data are quite limited in spatial coverage and temporal coverage. We believe the papers in this special issue will provide important reference for strategic plans in future in situ observations over TibXS. In turn, such observations are critical to substantiating and validating current and future geodetic results. We thank the responsible editor, Prof. Chung-Hsiung Sui, and the assistant editors, Mei-Ling Chen and Yunling Tseng, for their painstaking efforts in helping to edit the papers. The comments from the reviewers are indispensable for enhancing the qualities of all papers.

Responsible Editor:

Chung-Hsiung Sui
Department of Atmospheric Sciences, National Taiwan University, Taipei, Taiwan
E-mail: sui@as.ntu.edu.tw

Guest Editors:

Kosuke Heki
Department of Natural History Sciences, Hokkaido University, Hokkaido, Japan
E-mail: heki@mail.sci.hokudai.ac.jp

Wenbin Shen
School of Geodesy and Geomatics, Wuhan University, Wuhan, China
E-mail: wbshen@sgg.whu.edu.cn

C. K. Shum
Division of Geodetic Science, School of Earth Sciences, The Ohio State University, Ohio, USA
E-mail: ckshum@osu.edu

Executive Guest Editor:

Cheinway Hwang
Department of Civil Engineering, National Chiao Tung University, Hsinchu, Taiwan
E-mail: cheinway@mail.nctu.edu.tw