

Preface to the Special Issue on Satellite Altimetry over Land and Coastal Zones: Applications and Challenges

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This special issue publishes peer reviewed papers stemming from the International Workshop on Coast and Land applications of satellite altimetry, held 21 -22 July 2006, Beijing, China. This workshop is financially supported by the Chinese Academy of Surveying and Mapping, National Chiao Tung University, Asia GIS and GPS Co., Chung-Hsing Surv. Co., Huanyu Surv. Eng. Cons. Inc., and Real-World Eng. Cons. Inc. Twenty-two papers were submitted to this issue for review, and 16 papers were accepted following an iterative peer-review process. The accepted papers cover subjects on: ICESat coastal altimetry (1), satellite altimetry applications in solid earth sciences (2), hydrology (4), land/coast gravity field modeling (4), and coastal oceanography (5).

As the title of this issue suggests, the focus of applications of satellite altimetry has shifted from the open oceans to coastal zones, continental hydrology and solid Earth science, where the exploitation of altimetry measurement is challenging and dedicated data processing techniques need to be developed. For example, radar altimeter waveforms interfered by land mass will not yield correct ranges without sophisticated waveform retracking. Geophysical corrections for sea surface heights over coastal zones may contain larger errors than in the open oceans. For virtually all altimetric applications, precise surface heights are essential. Considerable effort is required to obtain accurate surface heights from altimetry over land and coastal zones. These papers highlight only some of the potential solutions for the problems in the coastal ocean and continental hydrology applications of satellite altimetry. There are still many obstacles to overcome before radar altimetry in oceanic coastal zones and over continents yields the same accuracy as in the open oceans. With the advent of the next generation of radar altimeters and laser altimeter/lidar that will operate at a much higher resolution with improved tracking mechanisms, further studies into these problems will represent future advances in this research area.

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