THE MAKING OF THE 1:3M GEOLOGICAL MAP SERIES OF MERCURY: STATUS AND UPDATES.

V. Galluzzi[1], L. Guzzetta[1], P. Mancinelli[2], L. Giacomini[1], A. M. Lewang[3], C. Malliband[4], A. Mosca[5], D. Pegg[4], J. Wright[4], L. Ferranti[5], H. Hiesinger[3], M. Massironi[6], C. Pauselli[2], D. A. Rothery[3], and P. Palumbo[7,1], [1]INAF, Istituto di Astrofisica e Planetologia spaziali (IAPS), Via del Fosso del Cavaliere 100, 00133, Rome, Italy (valentina.galluzzi@iaps.inaf.it), [2]Dipartimento di Fisica e Geologia, Università degli Studi di Perugia, Perugia, Italy, [3]Institut für Planetologie, Westfälische Wilhelms-Universität, Münster, Germany, [4]School of Physical Sciences, The Open University, Milton Keynes, UK, [5]DiSTAR, Dipartimento di Scienze della Terra, dell'Ambiente e delle Risorse, Università "Federico II", Naples, Italy, [6]Dipartimento di Geoscienze, Università degli Studi di Padova, Padua, Italy, [7]Dipartimento di Scienze & Tecnologie, Università degli Studi di Napoli 'Parthenope', Naples, Italy.

Introduction: By the end of the NASA Mariner 10 mission, 45% of Mercury's surface had been imaged by the M10 Television Experiment and over 2000 useful pictures were available at a resolution better than 2 km, up to 100 m. These results led to the production of 1:5M geologic maps of seven of the fifteen quadrangles of Mercury [1]. The NASA MESSENGER mission filled the gap by imaging 100% of the planet with a frame resolution up to 8 m/pixel at the north pole, and a global average resolution of 200 m/pixel, enabling preparation of a new global 1:15M geologic map [2]. Today, a complete global series of 1:3M-scale maps of Mercury is being prepared in support to the ESA/JAXA BepiColombo mission [3]. Born from individual geologic quadrangle maps [4, 5, 6], it has evolved into a coordinated global mapping plan, and carried on with the aim of exploiting MESSENGER images at the best resolution available (i.e., global average resolution) in order to set up the context for BepiColombo operations and help re-define mission goals as appropriate.

Current status: Currently, H02 Victoria [4], H03 Shakespeare [6] and H04 Raditladi [5] have been completed; H05 Hokusai [7], H06 Kuiper [8], H07 Beethoven [e.g., 9], H10 Derain [10] and H14 Debussy are being mapped (Fig. 1). The produced geologic maps were merged adjusting mismatches along the quadrangle boundaries. At the current stage, ~35% of Mercury has now a complete 1:3M-scale map and ~55% of the planet will be covered soon by the maps that are being prepared. This series of 1:3M-scale quadrangle maps cannot be merged into a single physical 1:3M-scale global map. However, the global merged output will be used as a digital full-scale product, which will permit detailed global or regional analyses of Mercury's surface. This project will lead to a fuller grasp of the planet's stratigraphy and surface history and is an important goal in preparation for the forthcoming ESA/JAXA BepiColombo mission to aid selection of scientific targets and to provide context for interpretation of new data.

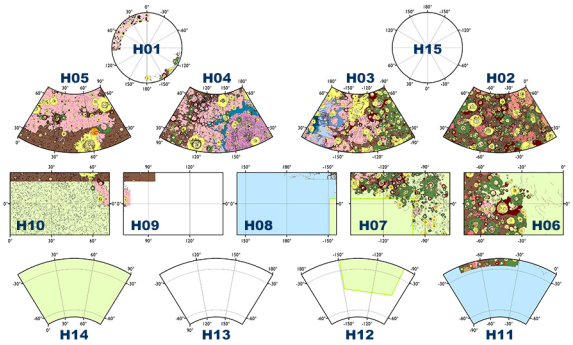

Figure 1. Current status of the 1:3M-scale geological map series of Mercury. The used projections are centered on each quadrangle: H01 and H15 Polar Stereographic; H02 to H05 Lambert Conformal Conic with standard parallels at 30°N and 58°N; H06 to H10 Equidistant Cylindrical; H11 to H14 Lambert Conformal conic with standard parallels at 30°S and 58°S. Background colors indicate quadrangles with mapping in progess (green) or scheduled work (blue).

Acknowledgements: This research was supported by the Agenzia Spaziale Italiana (ASI) within the SIMBIOSYS project (ASI-INAF agreement n. I/022/10/0).

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