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1:3M Geological Mapping of the Derain (H-10) Quadrangle of Mercury

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1:3M GEOLOGICAL MAPPING OF THE DERAİN (H-10) QUADRANGLE OF MERCURY. C.C. Malliband¹, D.A. Rothery¹, M.R. Balme¹, and S.J. Conway², ¹School of Physical Sciences, The Open University, Milton Keynes, MK7 6AA, UK (chris.malliband@open.ac.uk), ²CNRS, Laboratoire de Planétologie et Géodynamique, Université de Nantes, France

Introduction: We are currently undertaking detailed (1:3M) geological mapping of the Derain (H-10) quadrangle of Mercury. This is as part of a coordinated European project to produce a complete set of geological maps [e.g. 1,2,3,4,5] in advance of BepiColumbo's arrival at Mercury. This mapping will aid mission planning and provide scientific context for Bepi-Colombo observations.

Data and Methods: The map is being produced in ArcGIS 10.5 using data from NASA's MESSENGER mission. Mapping is being conducted principally using the 166 m/pixel (meters per pixel) BDR mosaic. This is complemented by a range of other MESSENGER products, in particular: Enhanced Colour (665 m/pixel), low incidence mosaics and the Global DEM (665 m/pixel). Features of particular interest are also investigated using individual frames from MESSENGER's Narrow Angle Camera. As the map is intended for publication at 1:3M, line work is being prepared principally at 1:300k in line with prior work [e.g. 1]. We are also mapping an extra 5° border beyond the Derain Quadrangle to allow better integration with adjoining maps.

Units: We aim to produce mapping that complements other geological mapping underway. This in-

cludes mapping crater degradation with both the 3-Class degradation scheme [1] (as shown in Figure 1) and the 5-Class degradation scheme [6].

Plains Units: The Derain quadrangle has a complex plains morphology, with numerous examples of small-scale smooth plains [7] and areas that do not easily classify as smooth or intercrater plains [8]. We are working to find a method to adequately display the visible geological relationships in these areas.

Progress and Ongoing Work: We have completed mapping large scale plains units and most crater ejecta in the north eastern portion of the quadrangle. Plains mapping will probably be updated to ensure the best representation of complex areas. We are continuing work to extend crater classification and ejecta mapping.

References: [1] Galluzzi V. et al, (2016), J. Maps, 12, Sup1, 227-238. [2] Mancinelli P. et al, (2016), J. Maps, 12, Sup1, 190-202. [3] Wright J. et al, (2018) LPSC 49, #2164. [4] Guzzetta L. et al. (2017) J. Maps, 13.2, 227-238. [5] Pegg D. L. et al., this volume. [6] Kinczyk M. J. et al. (2016) LPS XLVII, #1573. [7] Malliband C.C., this volume. [8] Galluzzi V. et al., this volume.

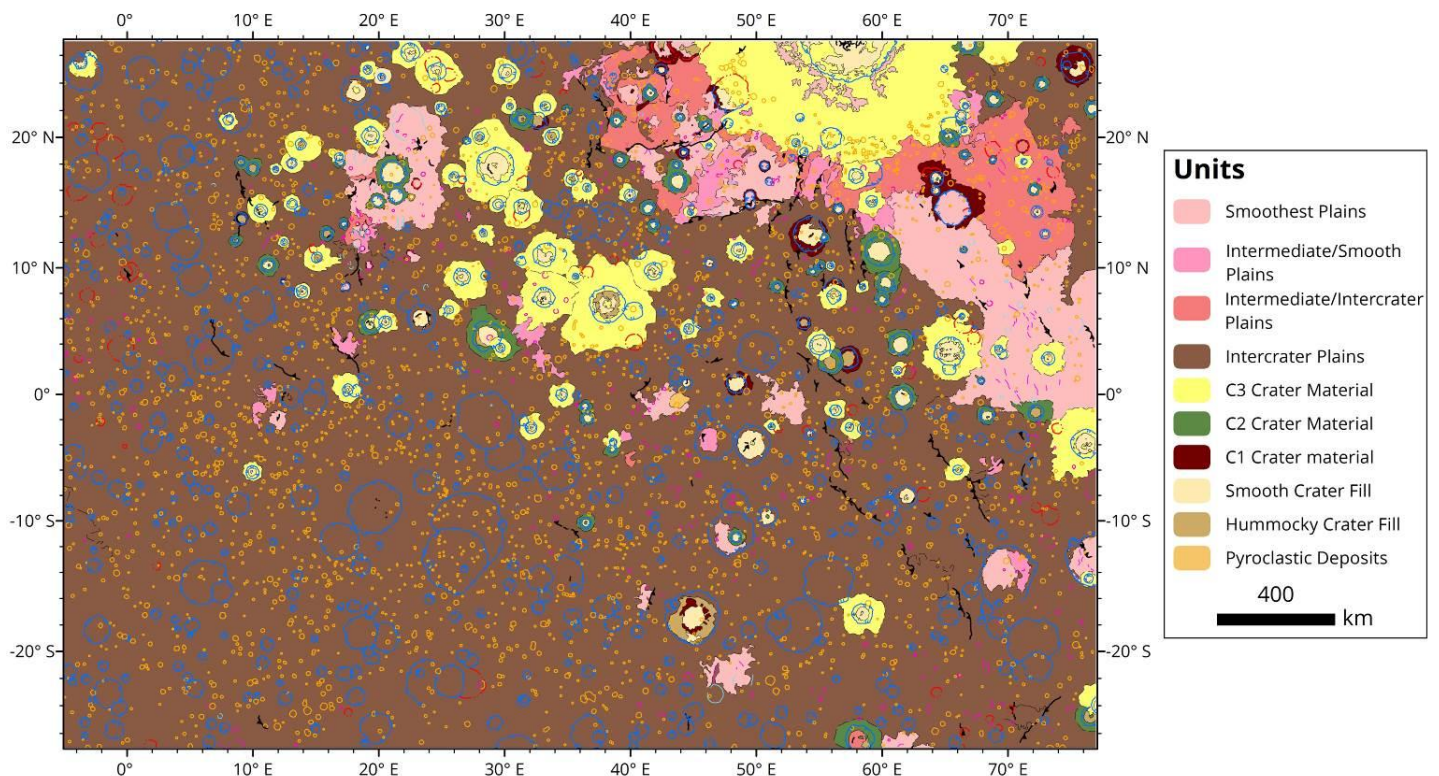


Fig 1. Working map (incomplete) of Derain quadrangle showing 3 class crater degradation scheme