HRSC MAPPING DATABASE: A NEW TOOL TO COLLECT AND VIEW AVAILABLE HRSC-BASED GEOLOGICAL MAPS WORLDWIDE. D. Tirsch[1], C. Pritzkow[1], T. Söte[1,2], A. Nass[1], S. Walter[3] , T. Giebner[1,3] and R. Jaumann[1,3], [1]Institute of Planetary Research, German Aerospace Center (DLR), Berlin, Germany, (daniela.tirsch@dlr.de). [2]Institut für Planetologie, Westfaelische Wilhelms-Universitaet, Muenster, Germany. [3]Institute of Geological Sciences, Freie Universitaet Berlin, Berlin, Germany.

Introduction: With the wealth of information and data obtained from the High Resolution Stereo Camera (HRSC) [1,2] on board the ESA Mars Express mission, we propose an online platform where information about currently available HRSC geological maps created by scientists from all over the world can be collected and viewed. The advantages of providing such a digital library are a quicker and more convenient search for information about authors, scientific objectives and the type of maps as well as accumulating all this information in one single place everyone can access.

Our goal is to help authors, researchers, journalists and others related to the field to conveniently and quickly obtain information about what has been done on the basis of HRSC so far and to easily identify those regions lacking geological maps.

HRSC data as a basis for geological maps: HRSC is a multi-sensor push broom instrument comprising nine CCD line sensors mounted in parallel for simultaneous high resolution stereo, multicolor and multi-phase imaging by delivering nine superimposed image swaths [1, 2]. Its design permits stereo imaging with triple to quintuple panchromatic along-track stereo, whose spectral range covers 675 ± 90 nm. The triple to quintuple stereo images permit robust stereo reconstruction, yielding Digital Terrain Models (DTMs) at a 3D accuracy better than the pixel resolution of the images.

The five panchromatic images are also used for multi-phase imaging allowing the determination of photometric surface characteristics. Multispectral imaging is realized by four line sensors in the blue, green, red and near infrared color ranges (440 ± 45 nm, 530 ± 45 nm, 750 ± 20 nm, 970 ± 45 nm). High-level image processing results in radiometrically corrected and orthorectified nadir and color images as well as high precision DTMs (level 4). In addition, rectified images using the MOLA DTM as basis for orthorectification are produced (level 3).

Now, about twelve years after receiving the first image, it has become even more important to maintain an overview of all the work that has been done, i.e. the geological maps that have been created on the basis of HRSC.

Database platform and operating mode: We demonstrate an additional "HRSC Mapping" layer in the already existing dynamic map server provided by the Freie Universitaet Berlin (FU Berlin) (http://maps.planet.fu-berlin.de, [3]). This dynamic map server provides pre-processed HRSC level 3 and level 4 data for download, as well as layers for Mars nomenclature and OMEGA pyroxene and olivine maps, respectively.

In the proposed additional layer, already published HRSC-based geological maps, will be displayed, showing the spatial extent of the analyzed areas as dark-colored outlines (Fig. 1).

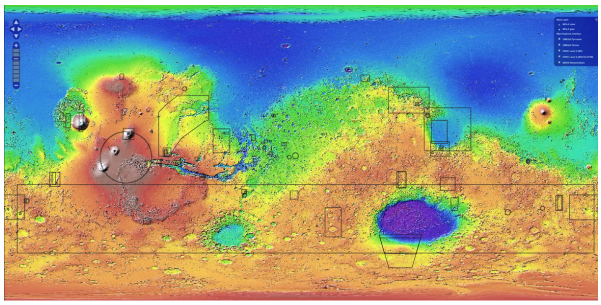

Fig. 1: Mapserver view: Topographic map of Mars with outlines of the available geological maps in the system.

Upon clicking on the polygons, an additional window appears (Fig. 2), providing all necessary information concerning:

- authors and the title of publication
- mapping region(s)
- scientific objectives of the map
- basis datasets
- notes, if applicable
- hyperlink to the respective publication.

Moreover, a preview image of the map will appear in order to give an impression of the work. Easy zoom and pan options are included in the server system.

The input dataset was collected and compiled by the German Aerospace Center (DLR) and will be updated continuously.

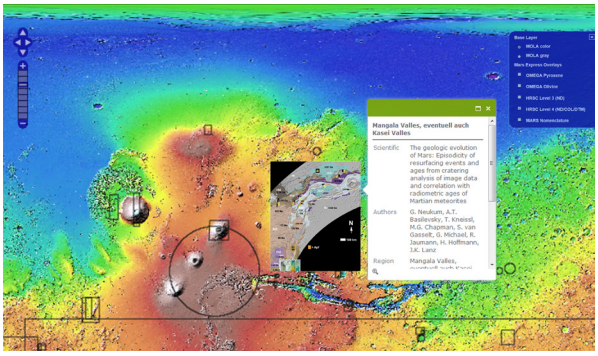

Fig. 2: Exemplary dataset for a mapping at the Kasei Valles region: Preview image and information window pops up upon clicking on mapping outlines.

Scientist can use this information to quickly identify areas that have not been mapped yet as well as to get an overview of the topics the existing maps focused on. Hence, they are able to quickly discover research areas and fields that still require a detailed and/or subsequent study. Especially for young scientists, it could provide an important point of reference for their studies.

References:

[1] G. Neukum and R. Jaumann, 2004, ESA SP, 1240:17–35. [2] R. Jaumann, et al., 2007, PSS, 55:928–952. [3] S. Wagner and S. van Gasselt, 2014, EPSC abstracts vol. 9, EPSC2014-567-4.