



iMars - Analysis of Mars multi-resolution images using auto-coregistration, data mining and crowd source techniques

iMars webGIS for visualisation of new global products from iMars

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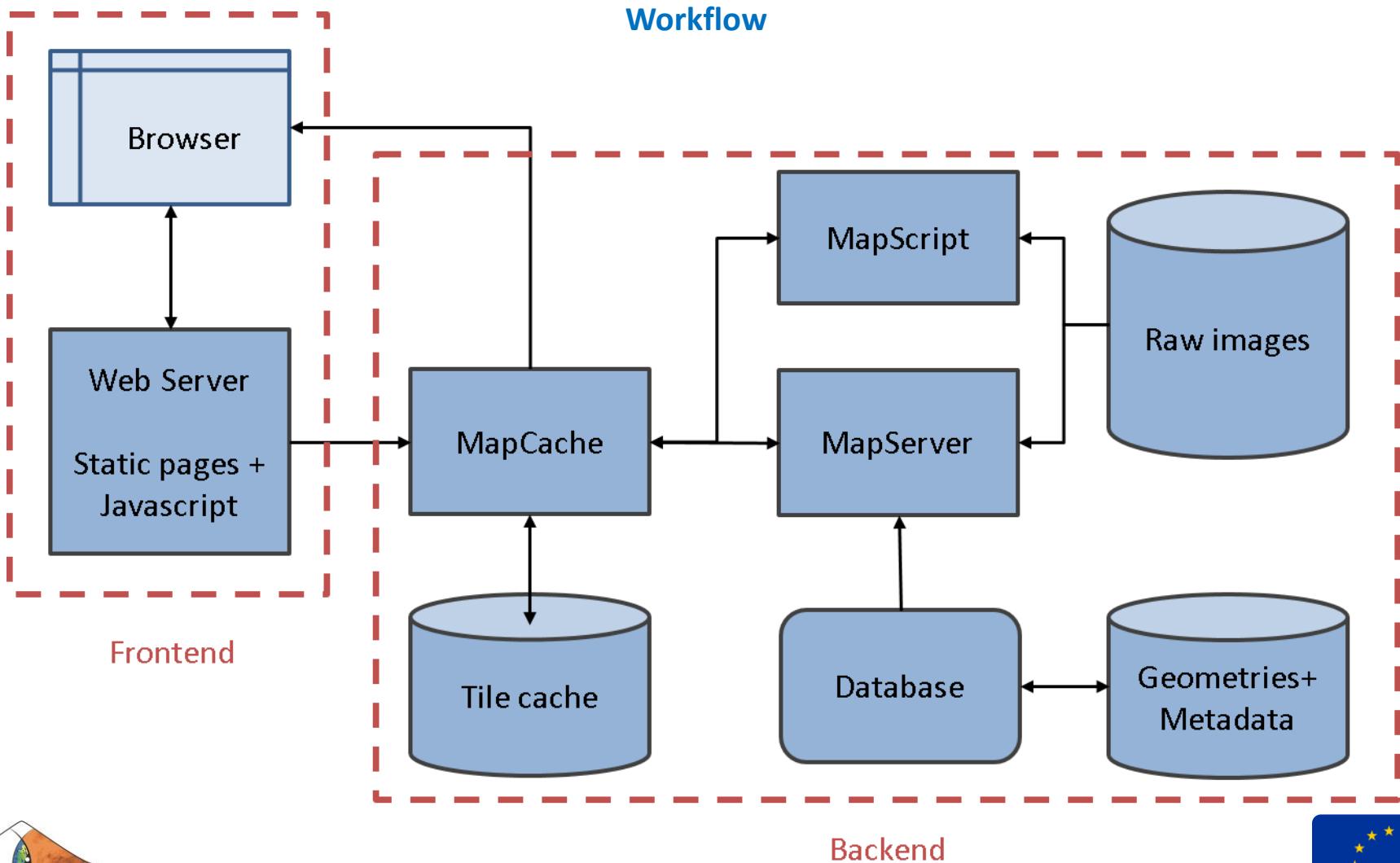
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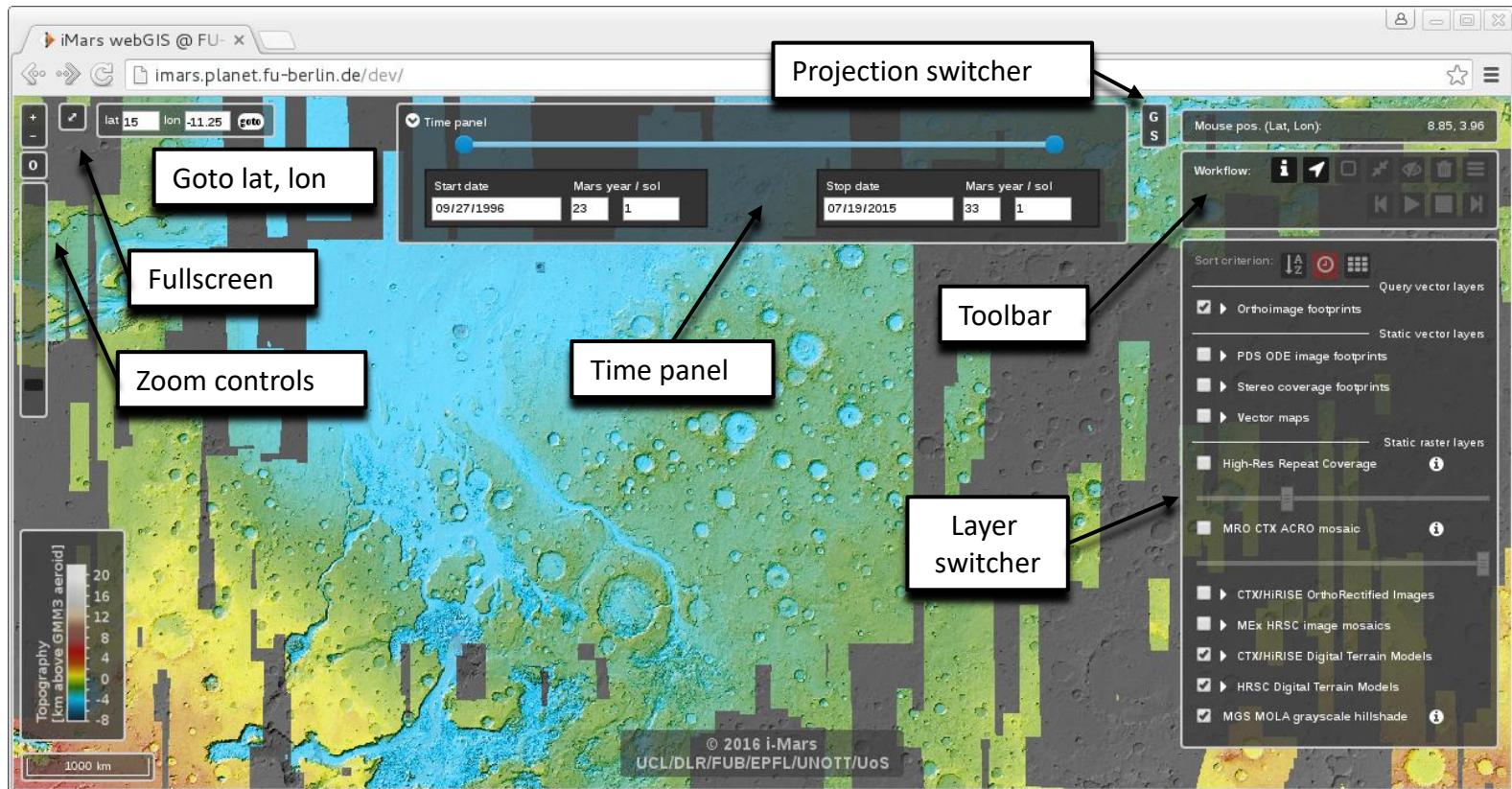
iMars webGIS – System Design





iMars webGIS – System Design

User interface (frontend)





iMars webGIS - Layers

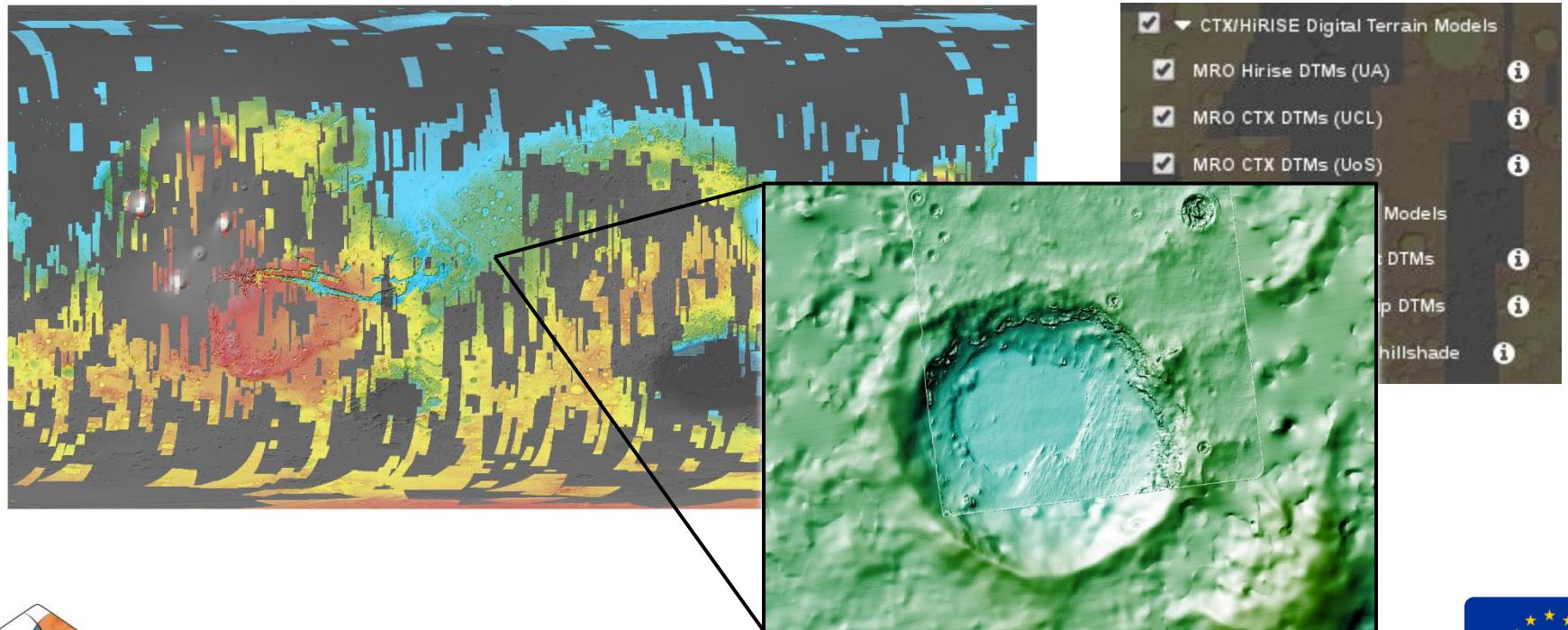
Overview

- Topographic base layers – group of DTM layers
 - MOLA, HRSC single, HRSC mosaic, CTX, HiRISE
- HRSC image mosaics
 - Panchromatic and colour with transparency slider
- CTX/HiRISE Orthorectified images
 - Orthoimages from UCL & UoS
- High-Res Repeat Coverage
- Vector Maps (Landing site markers, quadrangle scheme, nomenclature)
- Coverage maps (from NASA and iMars)
- Queryable image footprints (ACRO + HRSC)

iMars webGIS - Layers

Topographic base map layer

- Stack of colour-coded shaded relief maps of available DTM data
- HRSC mosaics, HRSC single-strips, CTX, HiRISE





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iMars webGIS - Layers

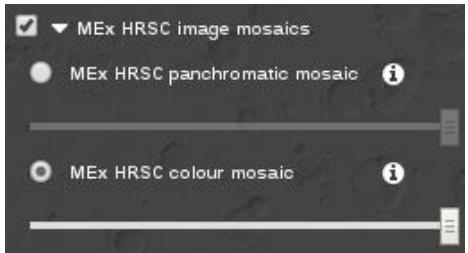
MEx HRSC MC11 image mosaics (panchromatic + colour)

The screenshot shows the iMars webGIS interface with a map of Mars. A black line highlights a specific area on the map, which is then shown in a larger inset view on the right side of the interface.

Map View:

- Lat: 14.14 Lon: 17.12
- Time panel: 17:29, 1.45
- Workflow: [Workflow icons]
- Mouse pos. (Lat, Lon): 17.29, 1.45
- Sort criterion: [Icon]
- Query vector layers
- Orthoimage footprints (checkboxes):
 - MGS MOC NA ACRO (UCL)
 - MRO CTX ACRO (UCL)
 - MO THEMIS VIS ACRO (UCL)
 - MEx HRSC N04
- PDS ODE image footprints
- Stereo coverage footprints
- Vector maps
- High-Res Repeat Coverage
- MRO CTX ACRO mosaic
- CTX/HiRISE OrthoRectified Images (checkboxes):
 - MEx HRSC image mosaics
 - MEx HRSC panchromatic mosaic (radio button selected)
 - MEx HRSC colour mosaic (radio button selected)
- CTX/HiRISE Digital Terrain Models (checkboxes):
 - MRO HiRISE DTMs (UA)
 - MRO CTX DTMs (UCL)
 - MRO CTX DTMs (UsG)
- HRSC Digital Terrain Models (checkboxes):
 - MEx HRSC multi-orbit DTMs
 - MEx HRSC single strip DTMs
 - MGS MOLA grayscale mosaics

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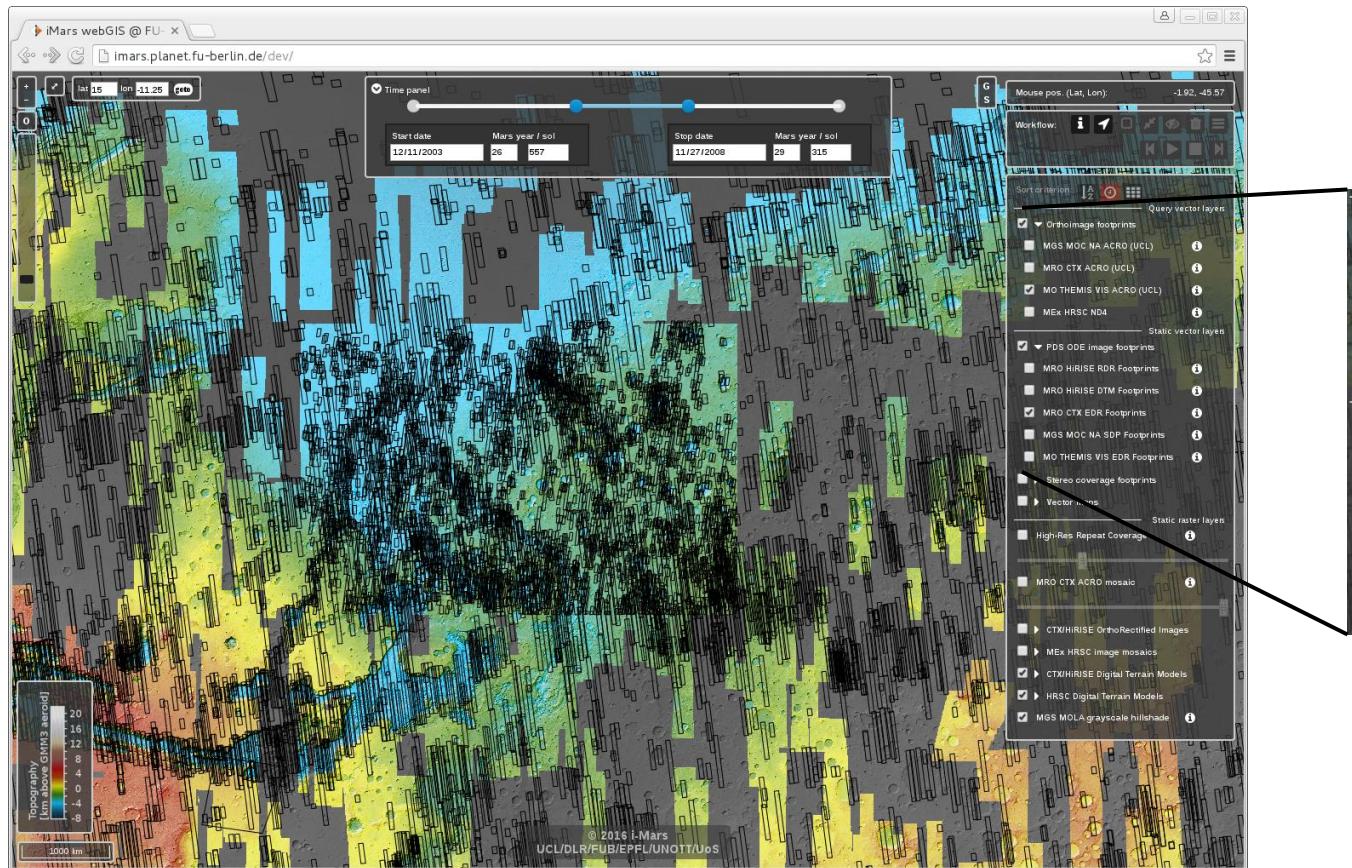


12.5 m/pixel



iMars webGIS - Layers

Footprint coverage layers (NASA + iMars)



- Query vector layers**
- Orthoimage footprints
 - MGS MOC NA ACRO (UCL)
 - MRO CTX ACRO (UCL)
 - MO THEMIS VIS ACRO (UCL)
 - MEx HRSC ND4
 - PDS ODE image footprints
 - MRO HIRISE RDR Footprints
 - MRO HIRISE DTM Footprints
 - MRO CTX EDR Footprints
 - MGS MOC NA SDP Footprints
 - MO THEMIS VIS EDR Footprints
 - Stereo coverage footprints
 - Vector mosaics
 - Static raster layers
 - High-Res Repeat Coverage
 - MRO CTX ACRO mosaic
 - Static vector layers
 - CTX/HIRISE OrthoRectified Images
 - MEx HRSC image mosaics
 - CTX/HIRISE Digital Terrain Models
 - HRSC Digital Terrain Models
 - MGS MOLA grayscale hillshade



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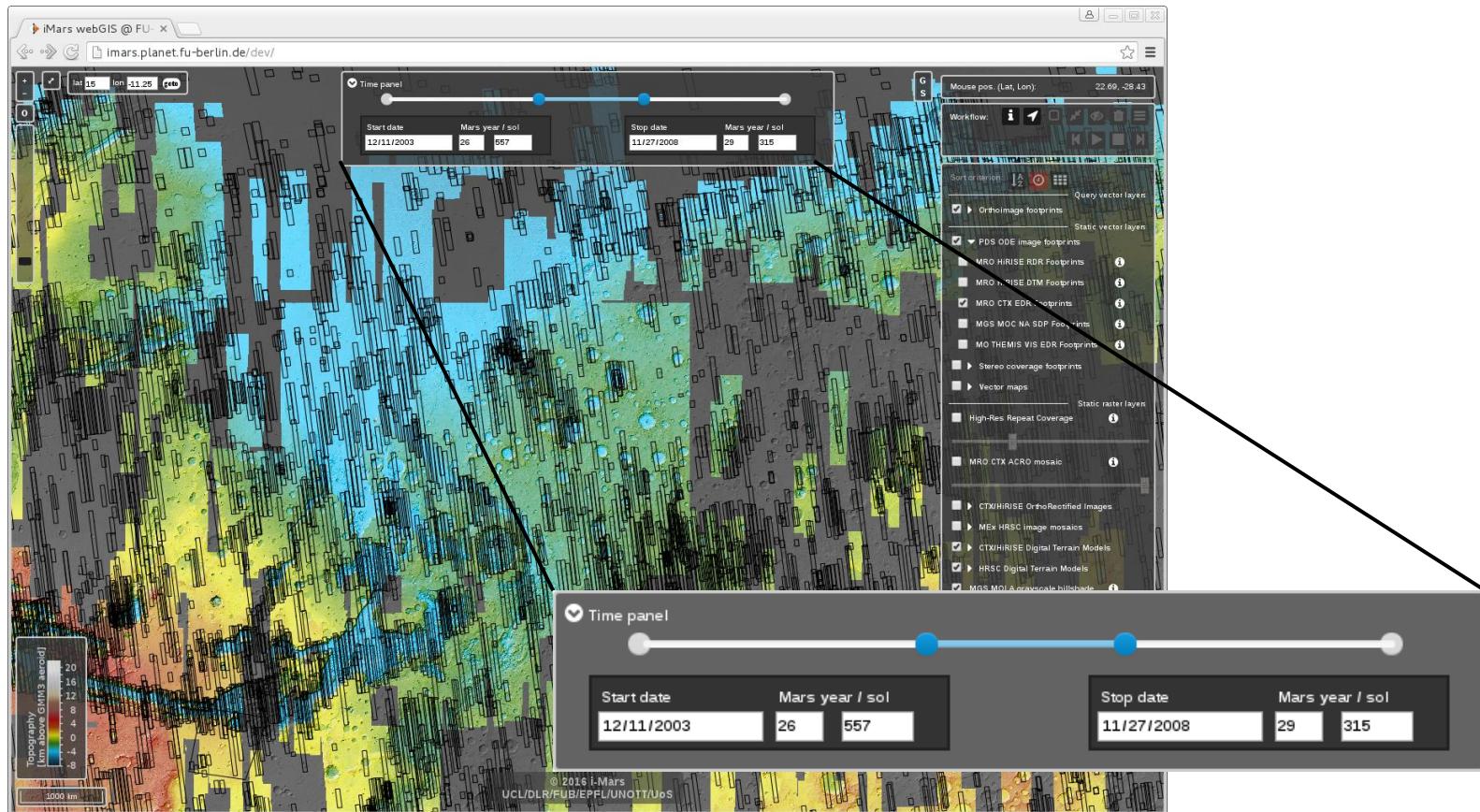


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iMars webGIS - Layers

Time Slider





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iMars webGIS – Single Images

Dynamic single image layers – workflow example

The screenshot shows the iMars webGIS interface displaying a grayscale image of the Martian surface. Several geological features are labeled with their names: Terra Sabaea, Oyama, Mawrth Vallis, McLaughlin, Keren, Coogoon Valles, and Oxus. The interface includes a topographic map view, a time panel at the top, and a sidebar on the right for managing layers. The sidebar categories include Orthoimage footprints (MGS MOC NA ACRO, MRO CTX ACRO, MO THEMIS VIS ACRO, MEx HRSC ND4), Vector maps (Landing sites markers, Quad scheme MC30, Mars nomenclature), and Digital Terrain Models (High-Res Repeat Coverage, MRO CTX ACRO mosaic). Other visible layers include CTX/HiRISE OrthoRectified Images (MEx HRSC image mosaics, CTX/HiRISE Digital Terrain Models, HRSC Digital Terrain Models, MGS MOLA grayscale hillshade).



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iMars webGIS – Single Images

Dynamic single image layers – workflow example

The screenshot shows the iMars webGIS interface with a grayscale Mars surface image. The sidebar on the right lists various dynamic single image layers:

- Orthoimage footprints
- MGS MOC NA ACRO (UCL) (checked)
- MRO CTX ACRO (UCL) (checked)
- MO THEMIS VIS ACRO (UCL) (checked)
- MEx HRSC ND4 (checked)
- PDS ODE Image footprints
- Stereo coverage footprints
- Vector maps
- Landing sites markers
- Quad scheme MC30
- Mars nomenclature (checked)
- High-Res Repeat Coverage
- MRO CTX ACRO mosaic
- CTX/HiRISE OrthoRectified Images
- MEx HRSC image mosaics
- CTX/HiRISE Digital Terrain Models
- HRSC Digital Terrain Models
- MGS MOLA grayscale hillshade



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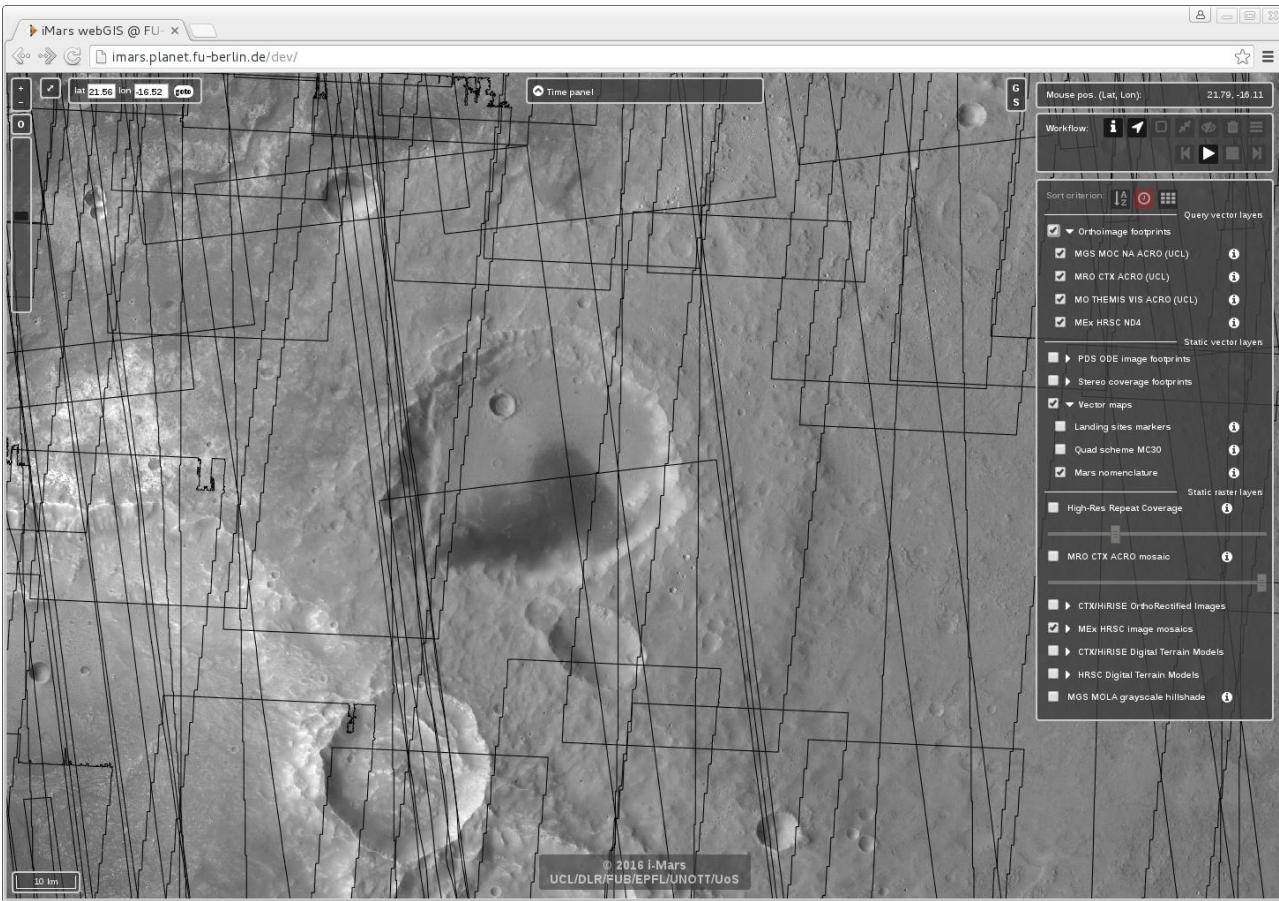
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iMars webGIS – Single Images

Dynamic single image layers – workflow example





iMars webGIS – Single Images

Dynamic single image layers – workflow example

Attribute query:

MRO CTX (ODE)

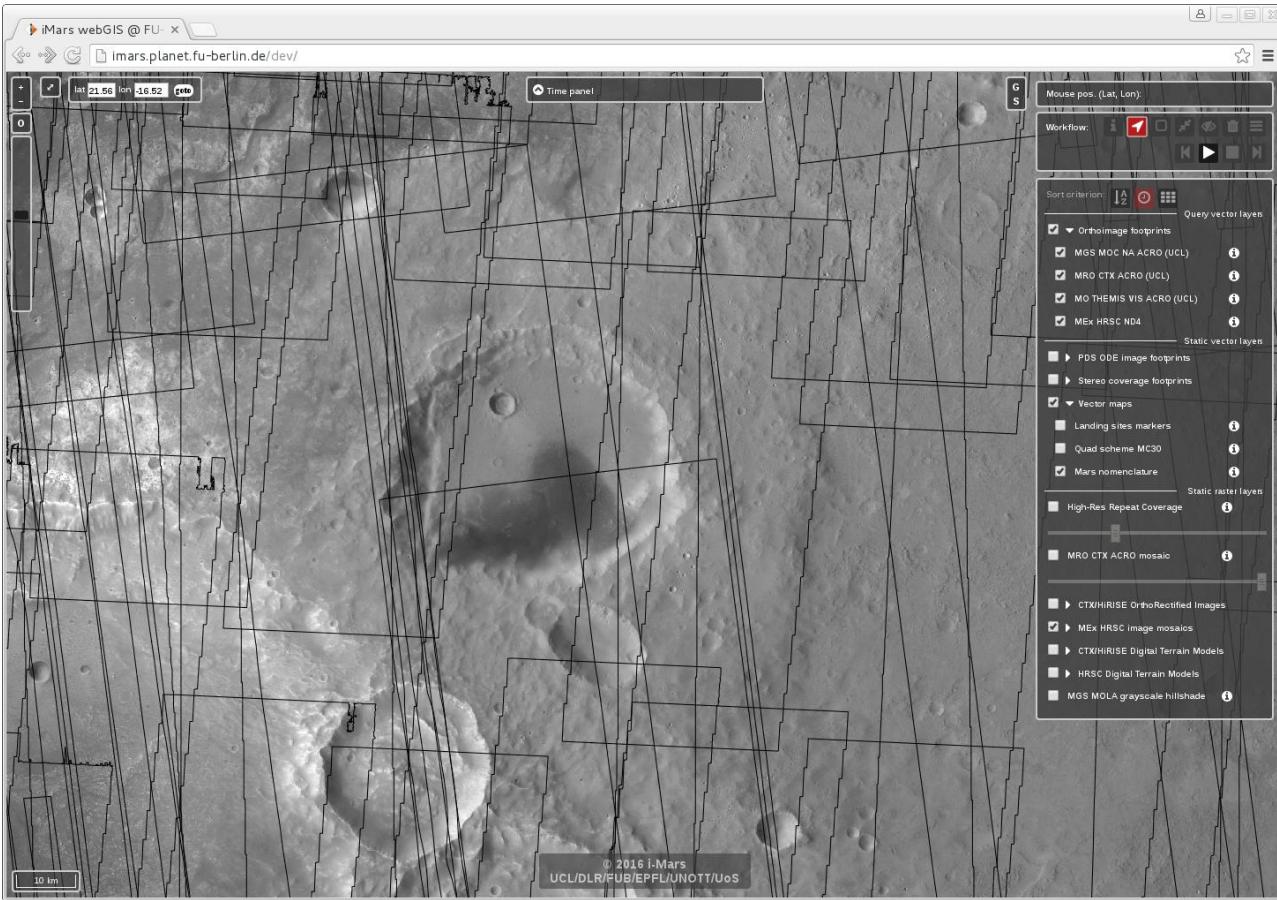
- Instrument ID: CTX
- Dataset ID: MPO-M-CTX-2-EDR-L0-V1.0
- Image time: 2008-10-14 09:51:57.547
- Product type: EDR
- Emission angle: 2.86
- Incidence angle: 51.20
- Phase angle: 48.37
- Solar longitude: 141.66

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iMars webGIS – Single Images

Dynamic single image layers – workflow example





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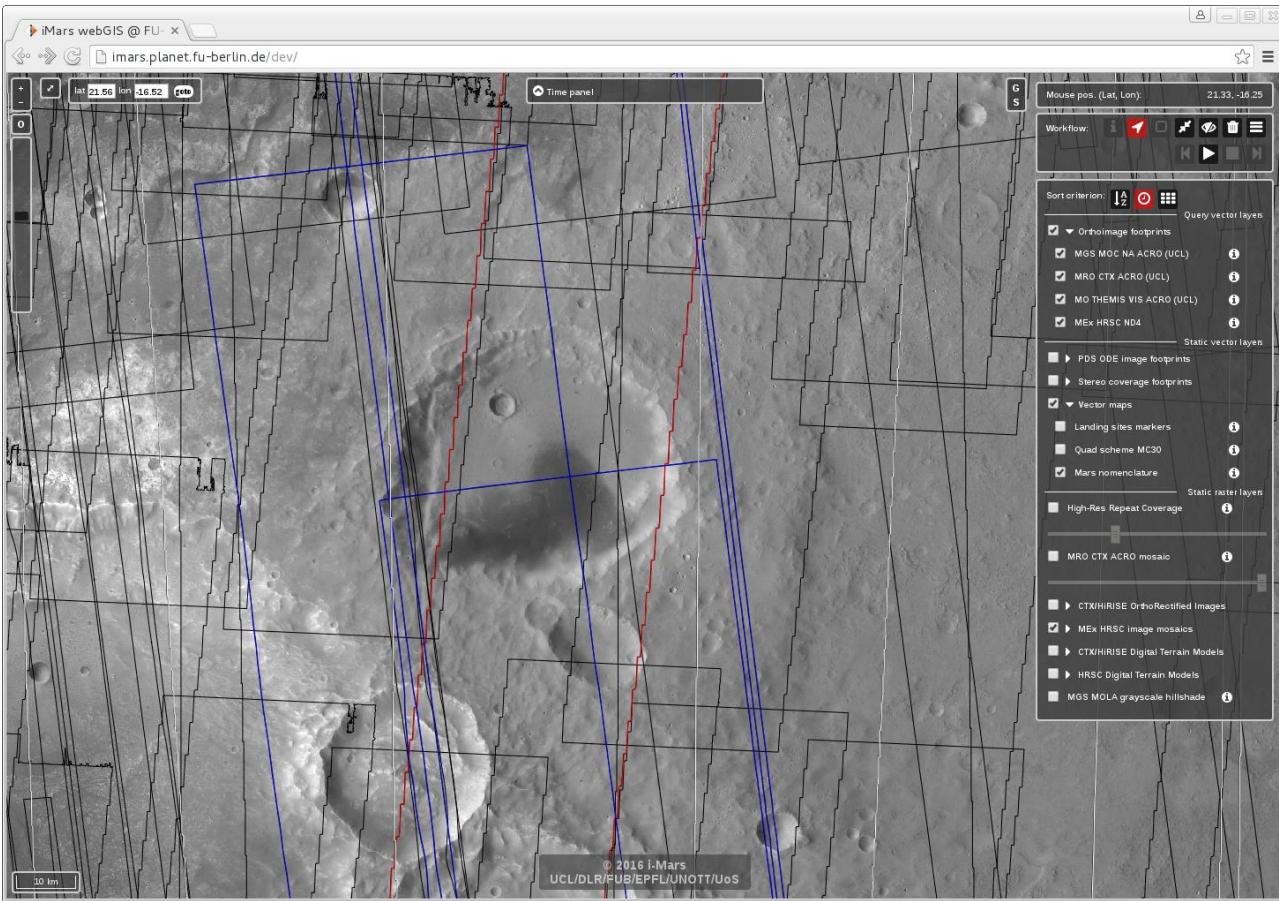


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iMars webGIS – Single Images

Dynamic single image layers – workflow example





iMars webGIS – Single Images

Dynamic single image layers – workflow example

The screenshot shows a Mars surface image with several blue and red polygonal outlines indicating dynamic single image layers. The interface includes a top bar with 'lat 21.56 lon -16.52' and a 'Time panel'. On the right, there's a 'Workflow' panel with a list of orthorectified images and other layers like MGS MOC NA ACRO. A legend at the bottom left shows a 10 km scale bar.

Workflow:

- Orthorectified images (12)
- V11921_0001LC
- h1542_0009.rnd4.70
- h2198_0001.rnd4.70
- h2229_0001.rnd4.70
- h5163_0009.rnd4.70
- h5181_0000.rnd4.70
- P16_007111_1997_XN_19N016W
- B02_010394_2026_XI_22N016W
- ha359_0000.rnd4.70
- hs423_0000.rnd4.70
- D22_035817_1999_XI_19N016W
- F01_036094_1999_XI_19N016W

Query vector layers:

- MGS MOC NA ACRO (UCL)
- MRO CTX ACRO (UCL)
- MO THEMIS VIS ACRO (UCL)
- MEX HRSC ND4

Static vector layers:

- PDS ODE image footprints
- Stereo coverage footprints
- Vector maps
- Landing sites markers
- Quad scheme MC30
- Mars nomenclature

Static raster layers:

- High-Res Repeat Coverage
- MRO CTX ACRO mosaic



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iMars webGIS – Single Images

Dynamic single image layers – workflow example

The screenshot shows the iMars webGIS interface with a dynamic single image layer of a Mars crater. The interface includes a map view, a time panel, and a sidebar for managing layers. The sidebar lists various orthorectified images and other vector and raster layers.

Orthorectified images (12):

- V11921_0000L0C
- h1542_0009.rnd4.70
- h2198_0001.rnd4.70
- h2229_0001.rnd4.70
- h5163_0009.rnd4.70
- h5181_0000.rnd4.70
- P16_007111_1997_XN_19N016W
- B02_010394_2026_XI_22N016W
- ha359_0000.rnd4.70
- hs423_0000.rnd4.70
- D22_035817_1999_XI_19N016W
- F01_036094_1999_XI_19N016W

Orthoimage footprints:

- MGS MOC NA ACRO (UCL)
- MRO CTX ACRO (UCL)
- MO THEMIS VIS ACRO (UCL)
- MEx HRSC ND4

Vector maps:

- Landing sites markers
- Quad scheme MC30
- Mars nomenclature

Raster layers:

- High-Res Repeat Coverage
- MRO CTX ACRO mosaic



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iMars webGIS – Single Images

Dynamic single image layers – workflow example

The screenshot shows the iMars webGIS interface at imars.planet.fu-berlin.de/dev/. The map displays a grayscale orthorectified image of a Mars surface, specifically the Hellas Planitia region. A time panel is visible at the top right. On the right side, a sidebar lists "Orthorectified images" with 12 items checked, including various file names like V119321009L0C, h1542_0009.nd4.70, etc. Other sections in the sidebar include "Orthoimage footprints" (MGS MOC NA ACRO, MRO CTX ACRO, MO THEMIS VIS ACRO, MEX HRSC ND4), "Vector maps" (Landing sites markers, Quad scheme MC30, Mars nomenclature), and "Raster layers" (High-Res Repeat Coverage, MRO CTX ACRO mosaic).



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iMars webGIS – Single Images

Dynamic single image layers – workflow example

The screenshot shows the iMars webGIS interface with a grayscale orthorectified image of a Mars surface. The interface includes:

- Map View:** Shows the Mars surface with various geological features like craters and ridges.
- Time Panel:** Located at the top center.
- Workflow:** A toolbar on the right with icons for selection, zoom, and other functions.
- Mouse pos. (Lat, Lon):** Displays coordinates: 22.08, -15.65.
- Sort criterion:** Set to "Orthorectified images (12)".
- Orthorectified images (12):**
 - V11921009L0C
 - h1542_0009.nd4_70
 - h2198_0001.rnd4_70
 - h2229_0001.rnd4_70
 - h5163_0009.nd4_70
 - h5181_0000.nd4_70
 - P16_007111_1987_XN_1SN016W
 - B02_010394_2029_XI_22N016W
 - ha369_0000.nd4_70
 - hc423_0000.nd4_70
 - D22_025817_1999_XI_19N016W
 - F01_036094_1999_XI_19N016W
- Orthoimage footprints:**
 - MGS MOC NA ACRO (UCL)
 - MRO CTX ACRO (UCL)
 - MO THEMIS VIS ACRO (UCL)
 - MEX HRSC ND4
- Static vector layers:**
 - PDS ODE image footprints
 - Stereo coverage footprints
 - Landing sites markers
 - Quad scheme MC30
 - Mars nomenclature
- Static raster layers:**
 - High-Res Repeat Coverage
 - MRO CTX ACRO mosaic

At the bottom left is a scale bar: 10 km. At the bottom center is the copyright notice: © 2016 i-Mars UCL/DLR/FUB/EPFL/UNOTT/UoS.

iMars webGIS – Conclusions

<http://www.i-mars.eu/web-gis>

- Achieved the main goal of interactive display of the **topographic datasets** and the **time series of images** provided by the consortium
- Ready for use in production - **stable** and **good performance** even for large datasets
- Forms the **core component** for **dissemination** of iMars products and serves as a **window for the project's achievements**
- Continuing updates of data at UCL
- Developments at FUB will continue with HRSC Map Server