

Scale 1:1 000 000

0 20 40 60 km

GENERAL NOTES

This map sheet is the 8th of a 15-quadrangle series covering the entire surface of Tethys at a nominal scale of 1: 1 000 000. The source of map data was the Cassini imaging experiment (Porco et al., 2004)[1].

Cassini-Huygens is a joint NASA/ESA/ASI mission to explore the Saturnian system. The Cassini spacecraft is the first spacecraft studying the Saturnian system of rings and moons from orbit; it entered Saturnian orbit on July 1st, 2004.
The Cassini orbiter has 12 instruments. One of them is the Cassini Imaging Science Subsystem (ISS), consisting of two framing cameras. The narrow angle camera is a reflecting telescope with a focal length of 2000 mm and a field of view of 0.35 degrees. The wide angle camera is a refractor with a focal length of 200 mm and a field of view of 3.5 degrees. Each camera is equipped with a large number of spectral filters which, taken together, span the electromagnetic spectrum from 0.2 to 1.1 micrometers. At the heart of each camera is a charged coupled device (CCD) detector consisting of a 1024 square array of pixels, each 12 microns on a side.

MAP SHEET DESIGNATION

Ste	Tethys (Saturnian satellite)
1M	Scale 1 : 1 000 000
0/180	Center point in degrees consisting of latitude/west longitude
SMN	Semi-controlled Mosaic with Nomenclature
2008	Year of publication

IMAGE PROCESSING [2]

- Radiometric correction
- Geometric correction
- Photogrammetric adjustment using limb-fit techniques
- Map projection
- Photometric correction using the Hapke bidirectional reflectance function
- Processing of the mosaic

CONTROL

For the Cassini mission, spacecraft position and camera pointing data are available in the form of SPICE kernels. SPICE is a data system providing ancillary data such as spacecraft and target positions, target body size/shape/orientation, spacecraft-orientation, instrument pointing used for planning space science missions and recovering the full value of science instrument data returned from missions (http://naif.jpl.nasa.gov/). While the orbit information was sufficiently accurate to be used directly for mapping purposes, the pointing information was improved using limb-fit techniques. Newly derived tri-axial ellipsoid models were used to calculate the surface intersection points. A spherical reference surface is used for map projections. The longitude system by Davies and Katayama (1983)[3] and adopted by the IAU/IAG (International Astronomical Union/International Association of Geodesy) Working Group on Cartographic Coordinates and Rotational Elements as standard (Seidelmann et al., 2007)[4] is defined by crater Arete; this crater defines the 299° meridian. To be consistent with this definition, the final semi-controlled atlas was shifted by 1.5° to the east.

MAP PROJECTION

Mercator projection onto a secant cylinder using standard parallels at 13°S and 13°N
Scale is true at 13°S / 13°N
Adopted figure: sphere
Mean radius: 536.3 km [5]
Grid system: planetographic latitude, west longitude

NOMENCLATURE

Names are suggested by the ISS-Camera-Team and approved by the International Astronomical Union (IAU). For a complete list of IAU-approved names on Tethys, see the Gazetteer of Planetary Nomenclature at http://planetarynames.wr.usgs.gov/.

REFERENCES

[1] Porco, C.C., West, R.A., Squyres, S., McEwen, A., Thomas, P.C., Murray, C.D., DelGenio, J.A., Ingersoll, A.P., Johnson, T.V., Neukum, G., Veverka, J., Dones, L., Brahic, A., Burns, J.A., Haemmerle, V., Knowles, B., Dawson, D., Roatsch, Th., Beurle, K. and Owen, W., 2004, Cassini Imaging Science: Instrument Characteristics and Anticipated Scientific Investigations at Saturn, Space Science Review 115, 363-497.

[2] Roatsch, Th., Wählisch, M., Giese, B., Hoffmeister, A., Matz, K.-D., Scholten, F., Kuhn, A., Wagner, R., Neukum, G., Helfenstein, P. and Porco, C.C., 2008, High-resolution Enceladus atlas derived from Cassini-ISS images, Planetary and Space Sciences 56, 109-116.

[3] Davies, M.E. and Katayama, F.Y., 1983, The Control Networks of Tethys and Dione, Journal of Geophysical Research 88A, 8729-8735.

[4] Seidelmann, P.K., Archinal, B.A., A'hearn, M.F., Conrad, A., Consolmagno, G.J., Hestroffer, D., Hilton, J.L., Krasinsky, G.A., Neumann, G., Oberst, J., Stooke, P., Tedesco, E.F., Tholen, D.J., Thomas, P.C. and Williams, I.P., 2007, Report of the IAU/IAG Working Group on cartographic coordinates and rotational elements: 2006, Celestial Mech Dyn Astr 98, 155-180.

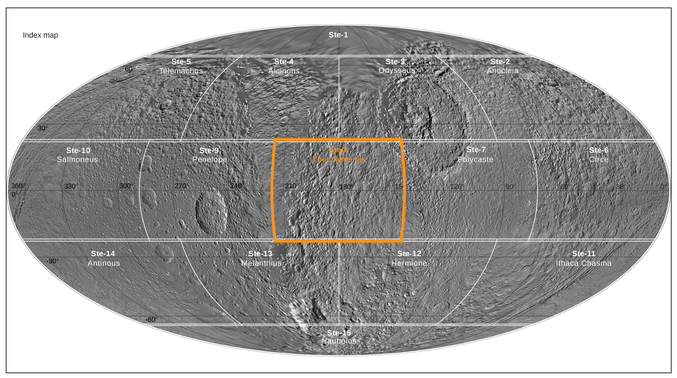
[5] Thomas, P.C., Burns, J.A., Helfenstein, P., Squyres, S., Veverka, J., Porco, C.C., Turtle, E.P., McEwen, A., Denk, T., Giese, B., Roatsch, Th., Johnson, T.V. and Jacobson, R.A., 2007, Shapes of the Saturnian Icy Satellites and their Significance, Icarus 179, 573-584.

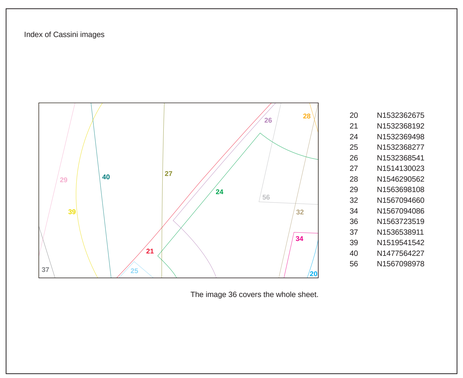
Image processing: Hoffmeister, A., Roatsch, Th., Scholten, F., Matz, K.-D. Cartographic production and design: Kersten, E., Wählisch, M.

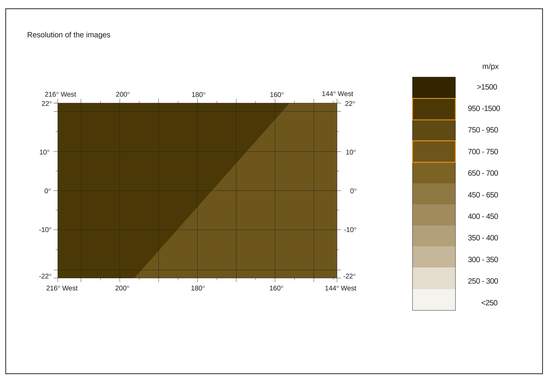
We greatly appreciate helpful discussions with Blue, J. and Kirk, R. (USGS).

EDITOR

German Aerospace Center (DLR), Institute of Planetary Research, Roatsch, Th. Please send comments, suggestions, and questions to Thomas.Roatsch@dlr.de.







German Aerospace Center