

Phoenix Landing Site Topomapping Update

Randolph Kirk, USGS

5th Phoenix Landing Site
Workshop

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Outline

- ◎ The Old Plan
- ◎ HiRISE Stereo Mapping: First Results
- ◎ Available Data
- ◎ The New Plan

The Old Plan

◎ Mapping results

- Latitude zone fairly homogeneous
- Benign at MOC resolution and larger

◎ Site selection—and imaging strategy

- Down-selected to Region B, 3 boxes therein

◎ USGS CDP deliverables

- 6 MOC DTMs by 1/07
- 4 partial HiRISE DTMs (best effort 1/07)
- 3 full HiRISE DTMs by 6/07

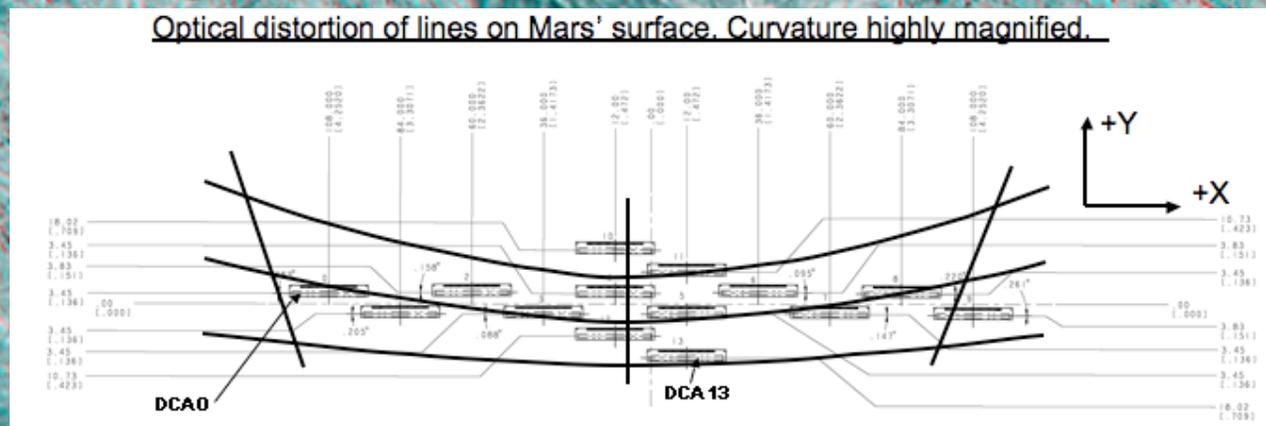
HiRISE Images of Region B

yikes!!!

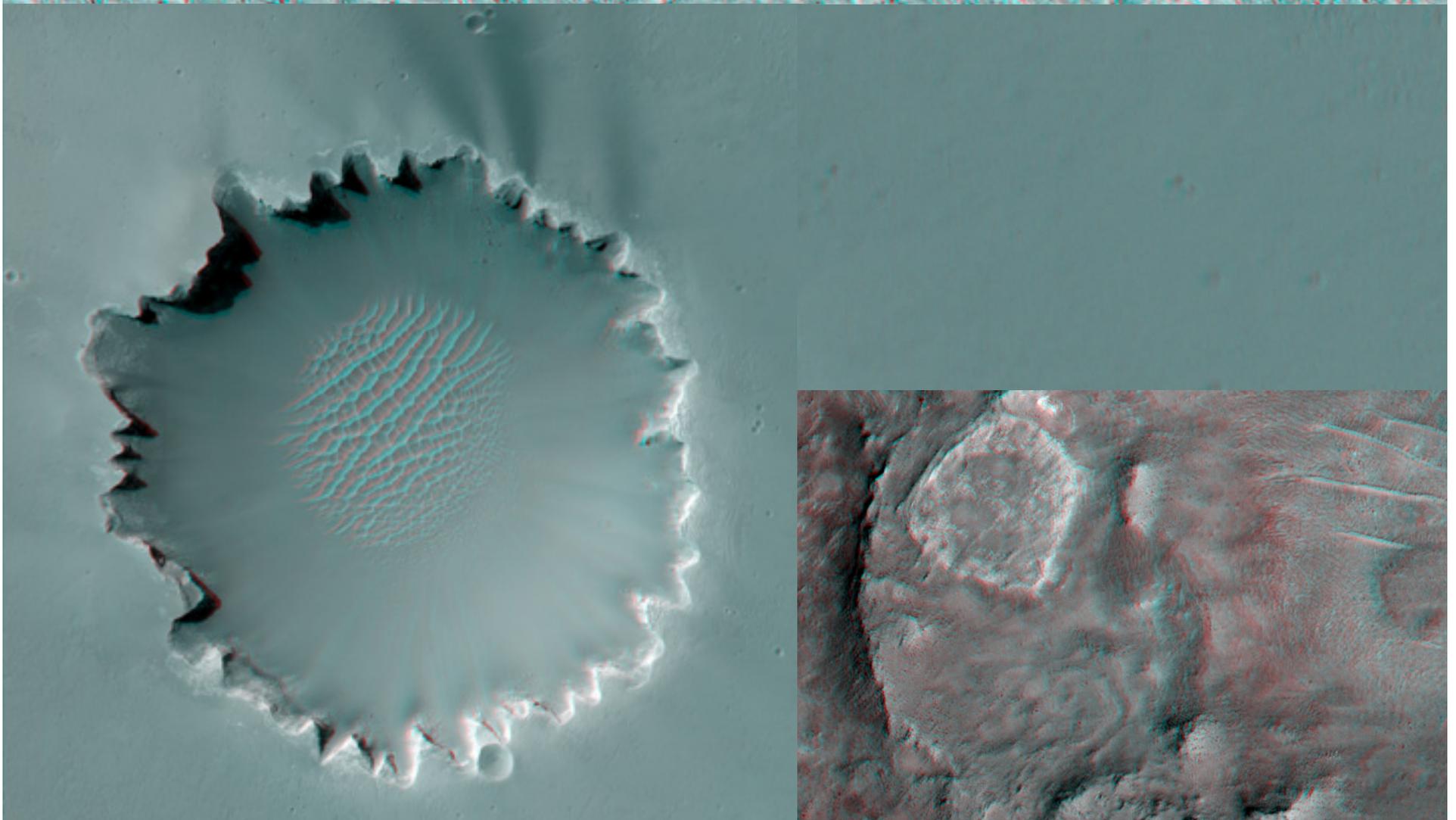


HiRISE Stereo Methodology

- What's the same as for MOC, HRSC?
 - Ingest in ISIS, stereomap in SOCET SET
- What's new?
 - ISIS 3 not ISIS 2
 - Geometric characteristics
 - Multiple offset & rotated detectors
 - Detectors offset from center of distortion
 - Jitter potentially greater (in pixels)
 - Pre-correct images for these effects by resampling with ISIS program *noproj*

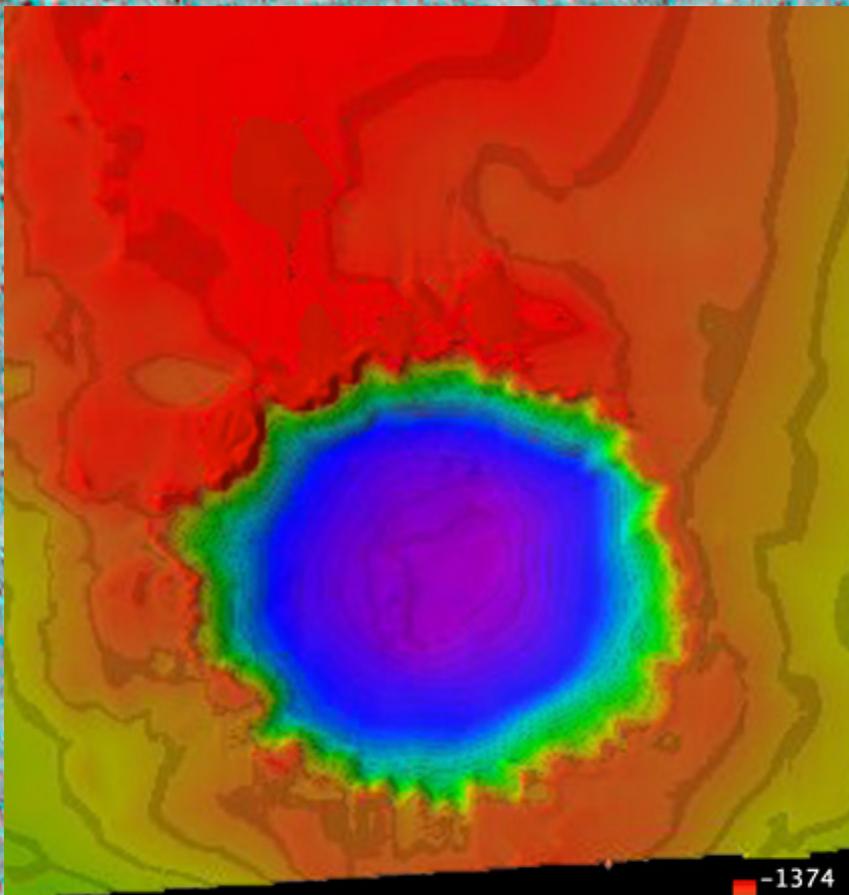


1st Stereopair Mapped: Victoria

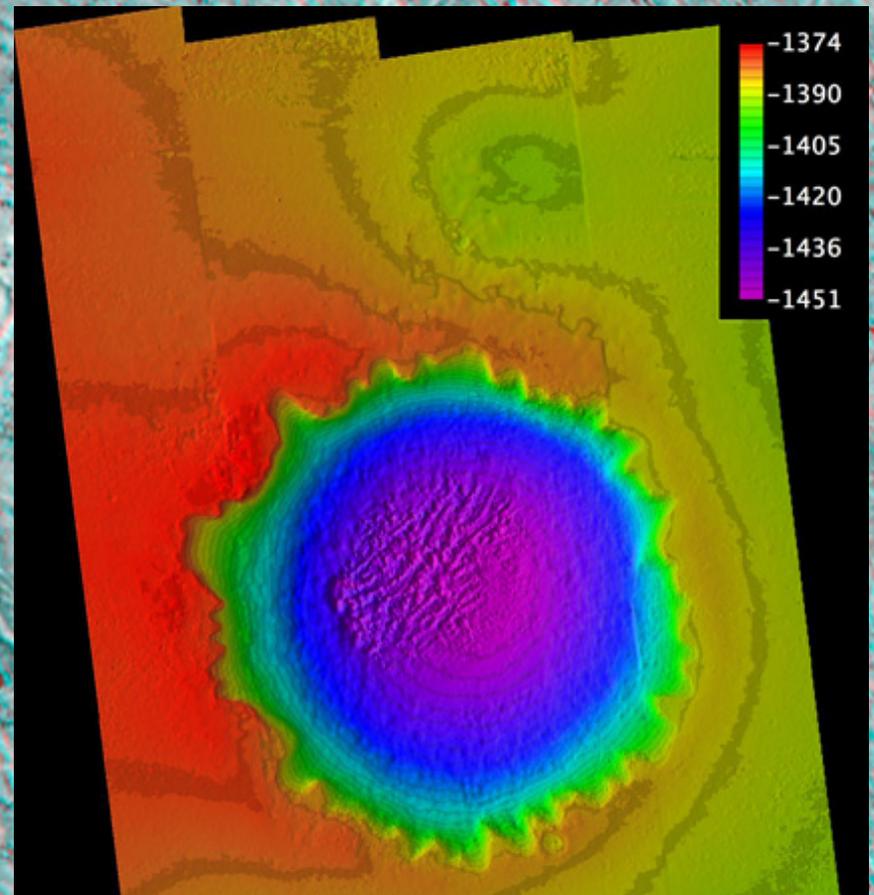
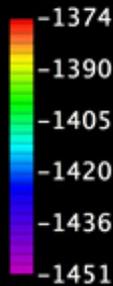


MOC, HiRISE DTMs Compared

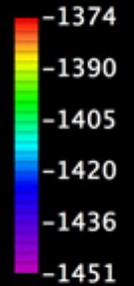
Contour Interval 3 m



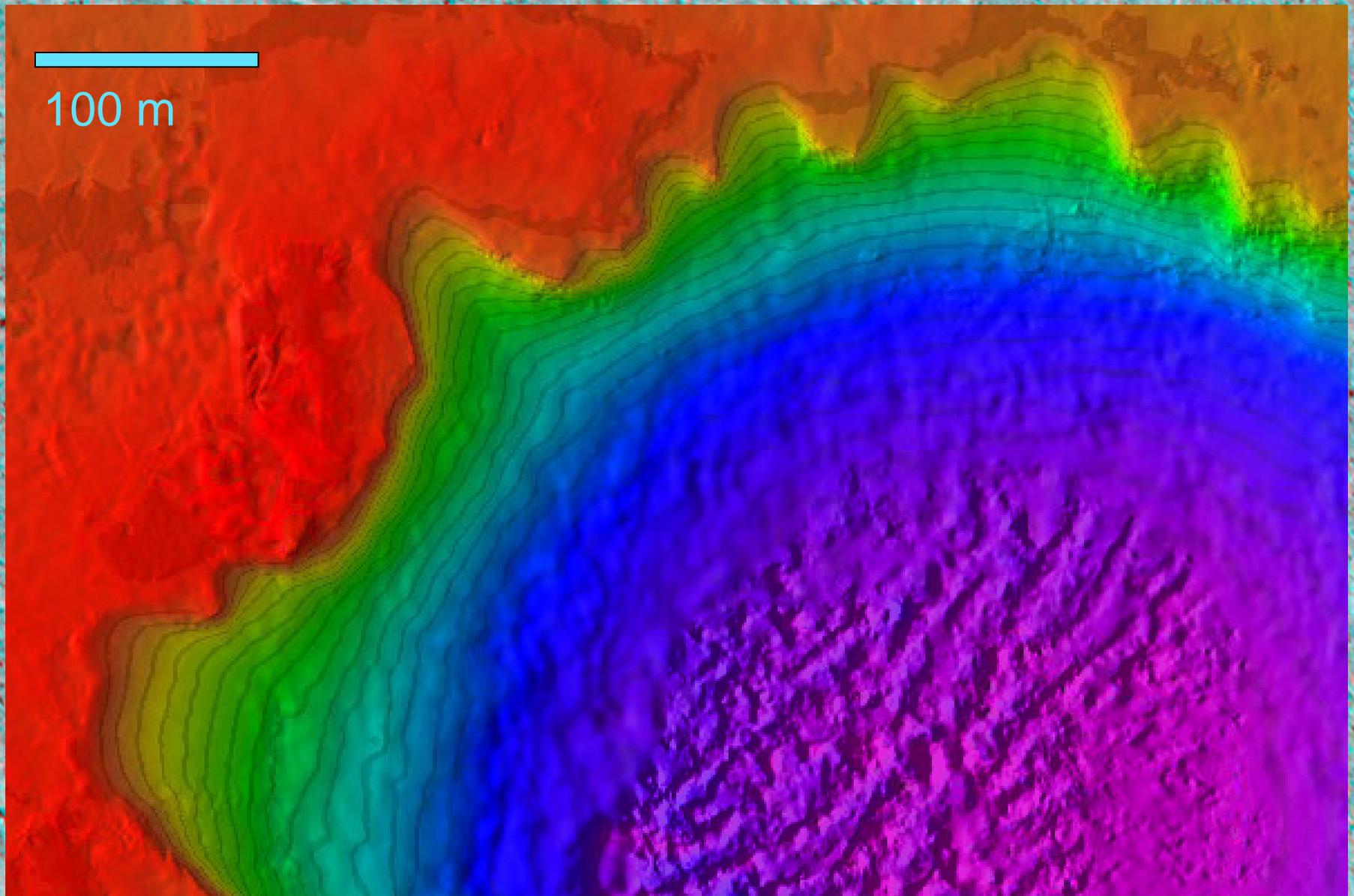
MOC: 5 m/post
Manually edited



HiRISE: 1 m/post Auto-
matching, limited editing

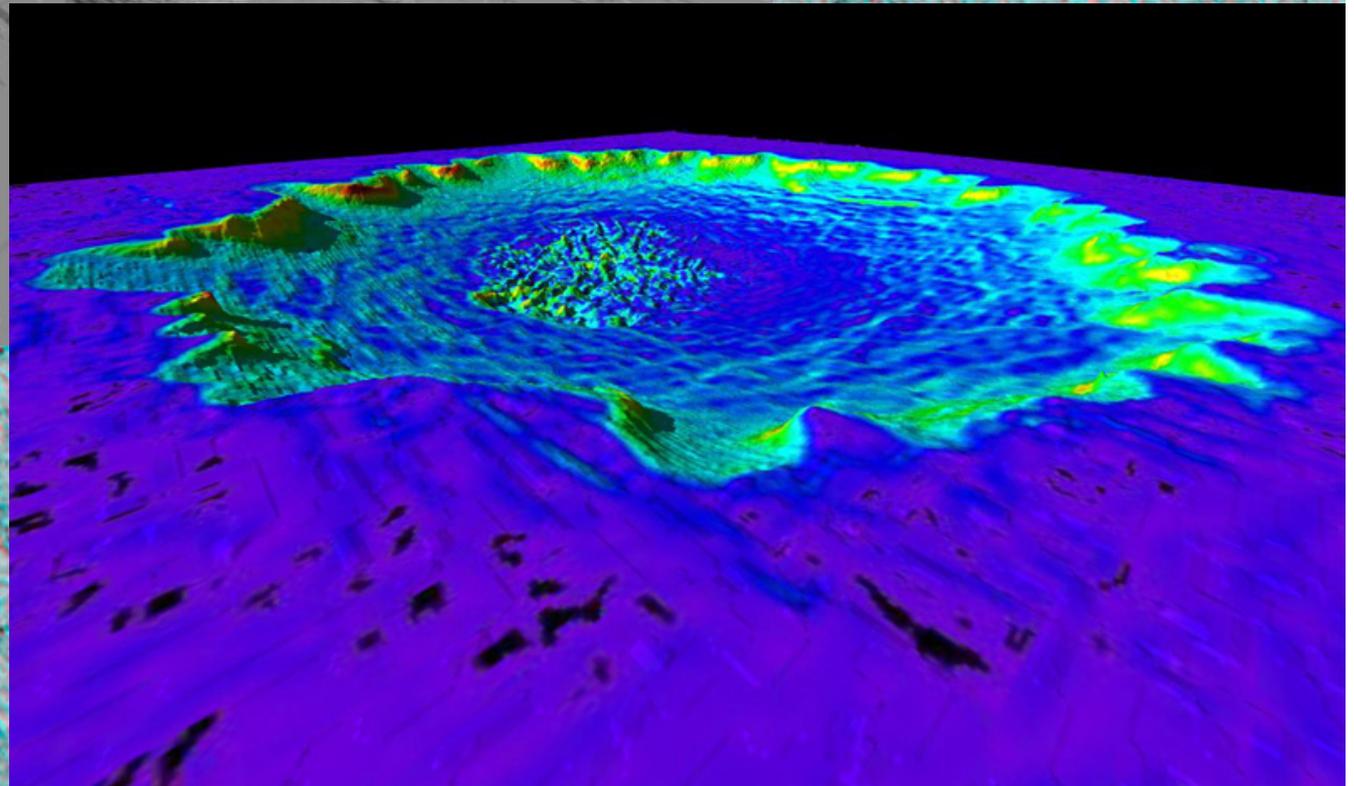
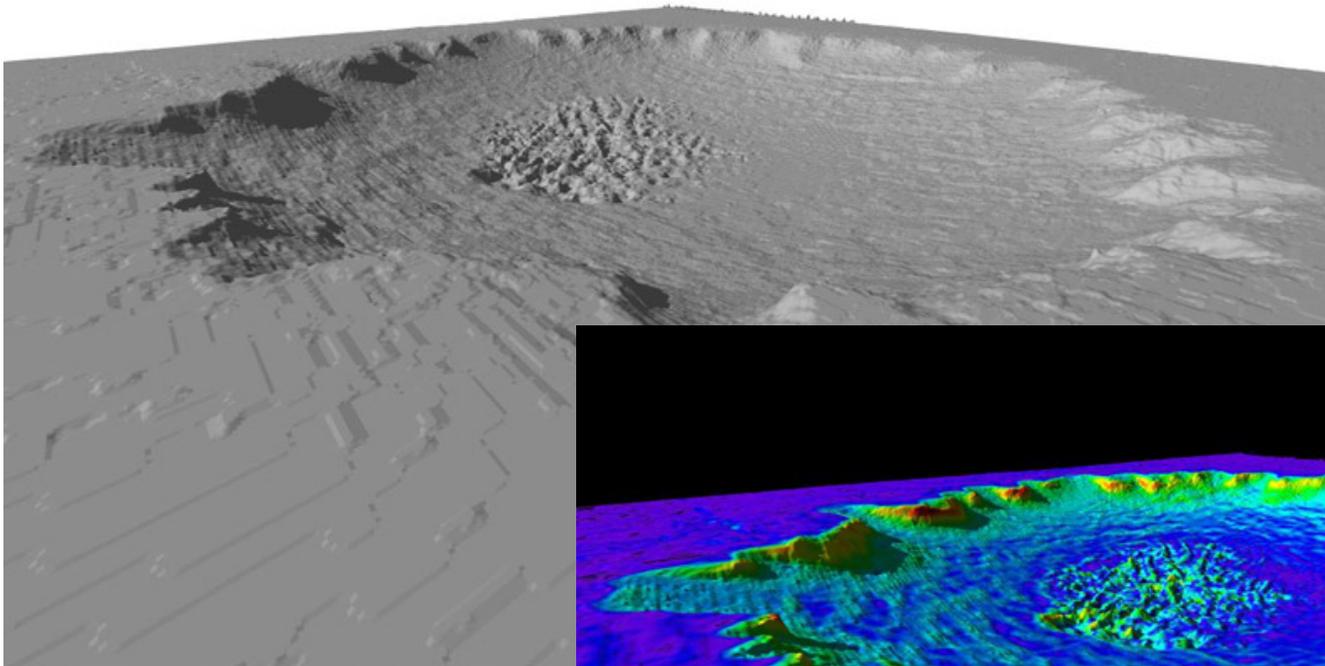


HiRISE DTM Enlarged



Perspective Views

Relief shading
No exaggeration



Absolute slopes
 0° – 60°

PHX LS WS #5

First Reactions

- ◎ HiRISE stereopairs support production of 1 m/post DTMs by automatic matching w/ minimal editing
- ◎ DTM “noise” of 0.2–0.3 m indicates 0.2–0.3 pixel RMS matching error (as for most other datasets)
- ◎ Cross-track jitter induces ~1 m height errors; along-track jitter does not prevent matching
- ◎ DTM is not visibly “warped” by optical distortion
- ◎ Matching succeeds even in bland areas (using DoG filter) but not in bland steep areas
- ◎ Matching succeeds in deep shadows, but moving shadow edges cause mismatches
- ◎ **Most other terrains will be easier to map**

HiRISE Stereopairs (to date)

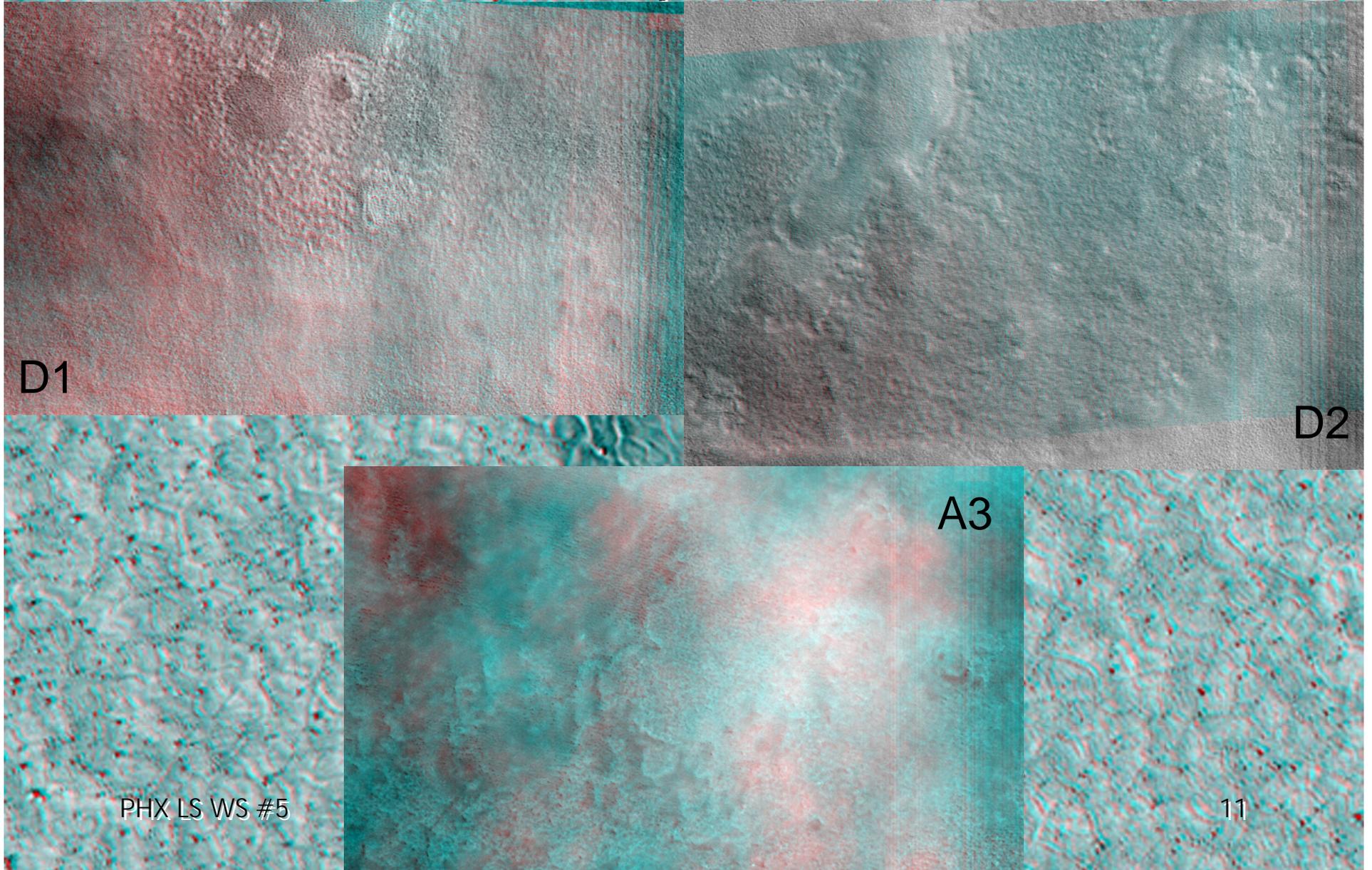
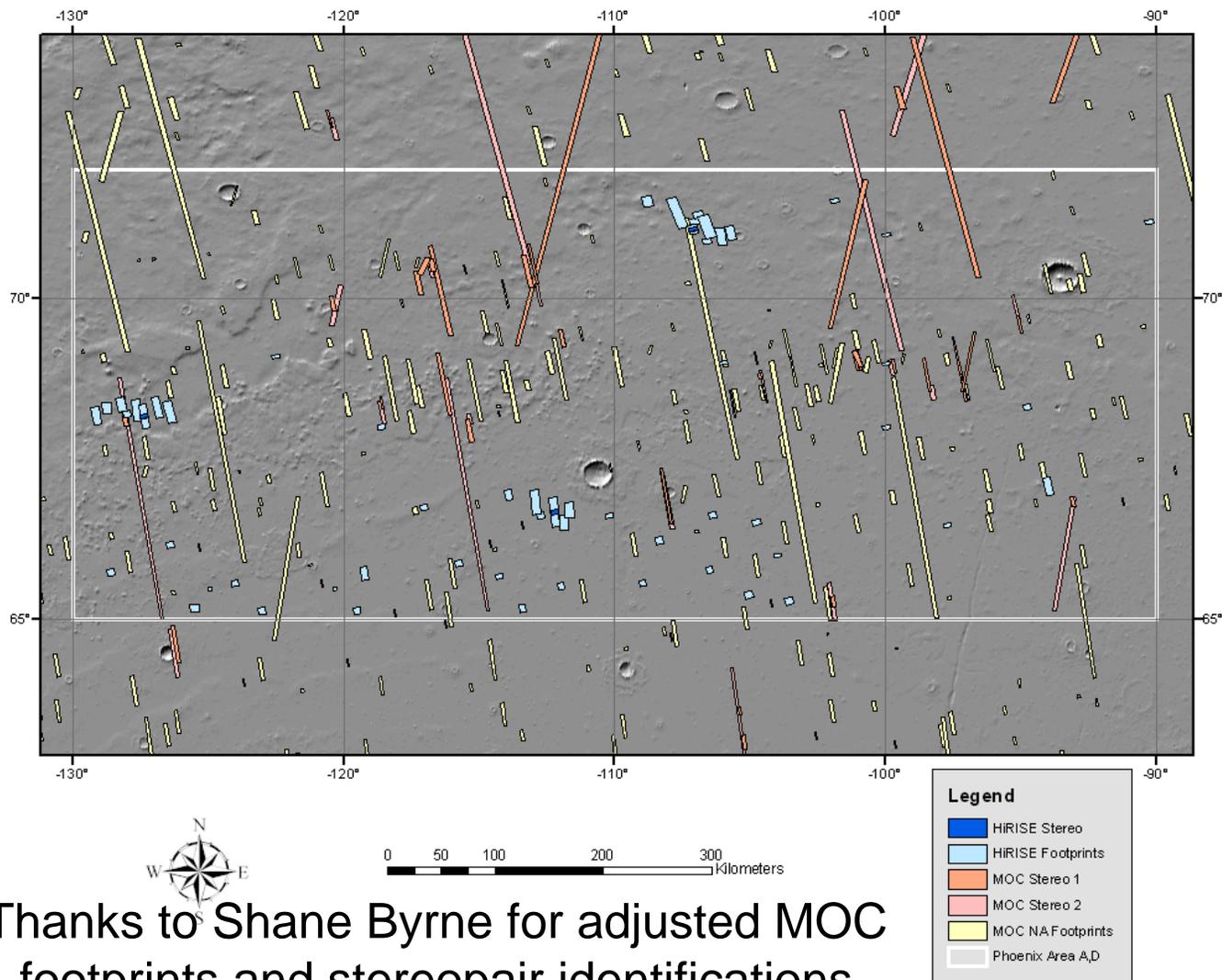


Image and Stereo Coverage: Regions A+D



PH

Thanks to Shane Byrne for adjusted MOC
footprints and stereopair identifications

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Summary of Available Data

	In Boxes A+D	In 65°–72° Zone
MOC Images	214	1558
MOC Stereopairs	28	186
HiRISE Images	61	126
HiRISE Stereopairs	3	4

The New Plan

- ◎ Full stereo DTMs from existing HiRISE pairs ("ST")
 - A3 pair may be problematic because of clouds)
- ◎ Additional full/partial HiRISE stereo DTMs from any pairs acquired before season ends
- ◎ Look for HiRISE images where photoclinoetry can be calibrated against MOLA ("M-PC") or against rock shadows if possible
- ◎ MOC ST in A+D
- ◎ MOC M-PC in A+D
- ◎ MOC ST elsewhere in zone
- ◎ MOC M-PC elsewhere in zone
- ◎ If all images are used *and customer is satisfied* before funding runs out, start HiRISE ST of MSL