

Planetary Surface RS



VENUS



EARTH



MOON



MARS



TITAN

Introduction

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MSc	1996	Cranfield U.	UK
DTSc	2006	AIT	TH
PostDoc	2008	IRRI	PH

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Assoc. Prof. (eq.)	2015	UoM	LK

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and its water management applications
in Asia and Australia

of course,

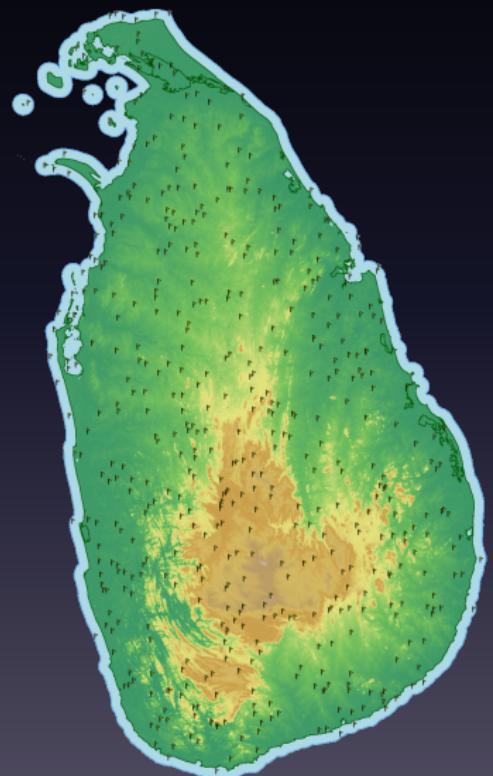
by remote sensing

The National Climate Observatory



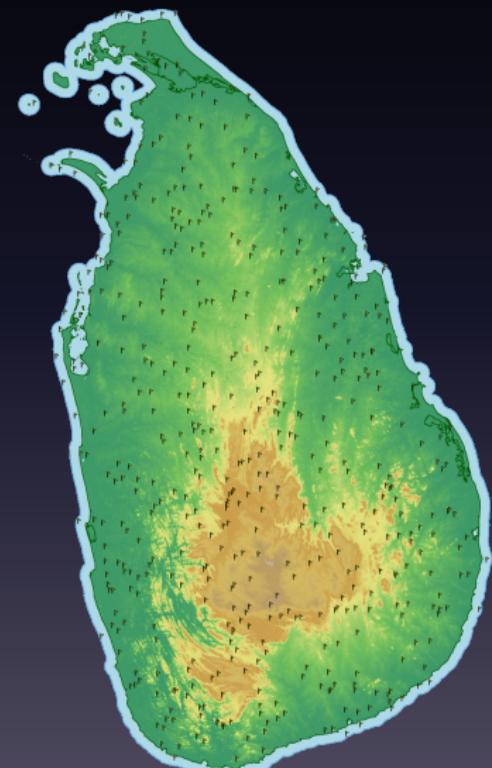
A National Climate Observatory

- National grid of stations
- Land and sea
- Public website
- Mobile Apps



National grid of stations

- 500 Weather Stations
- 5 minutes Reporting
- Climate-Based Grid
- Online
- $1/20^{th}$ Cost
- Improve Forecasting



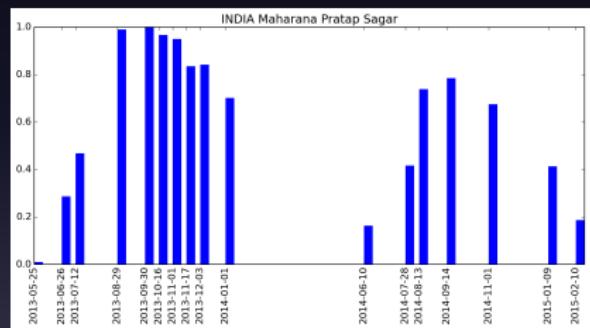


Water Level Virtual Gauge

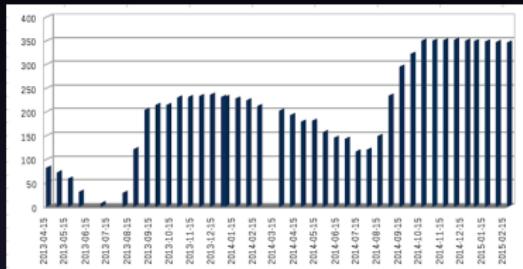


Water Level Virtual Gauge

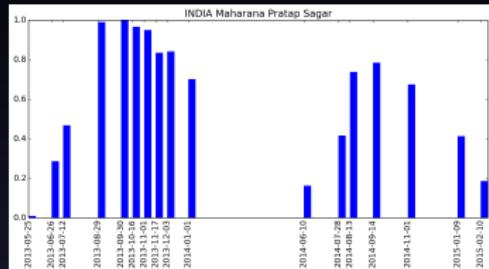
- Landsat Imagery
- Water line
- 12cm V. accuracy
- 10-700Km²
- Next:
Orbital Altimetry



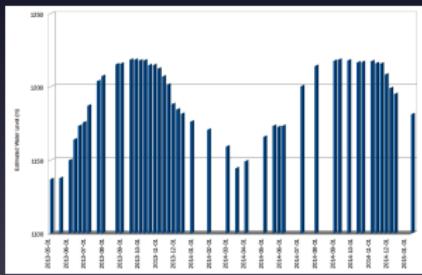
water Level Virtual Gauge



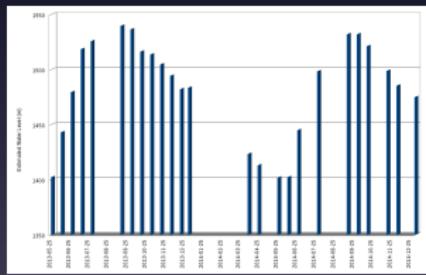
Aswan Dam (EG)



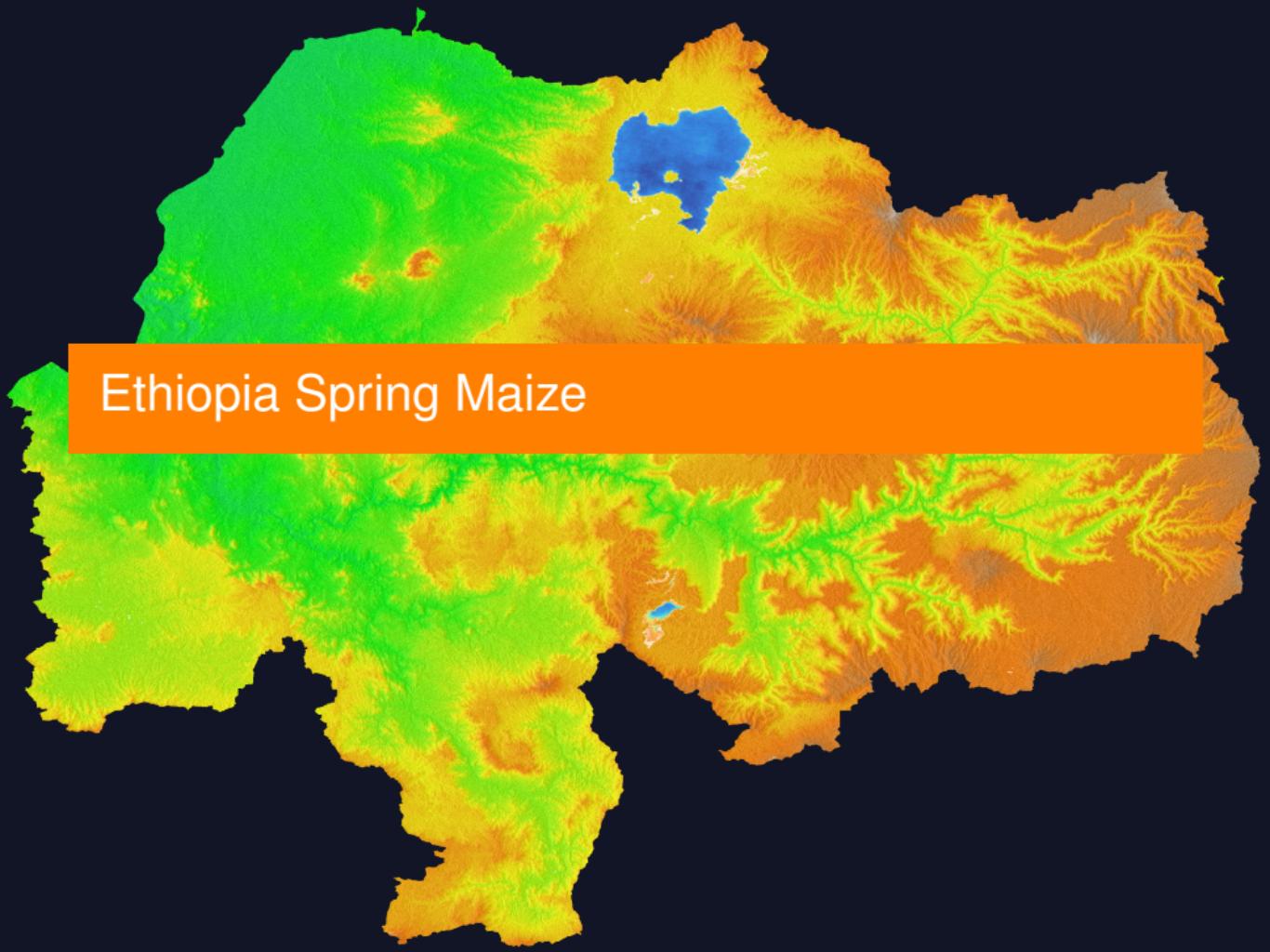
Maharashtra Pratap Sagar (IN)



Mangla Dam (PK)



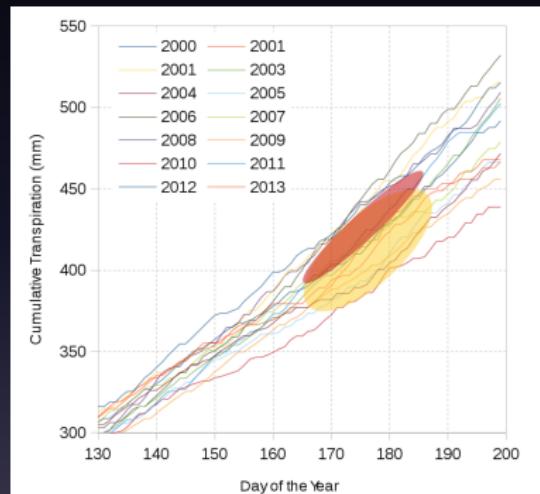
Tarbela Dam (PK)



Ethiopia Spring Maize

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- Farmer perspective
- Water scarcity
- Spring Maize
- $\frac{1}{4}$ year is good
- Water Q missing?



For the last 4 years

while assuming my different employments

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I am a DL BSc student in
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giving out my dissertation in April 2016

Middle Crescent Crater



Hyperspectral Assessment of Apollo 12

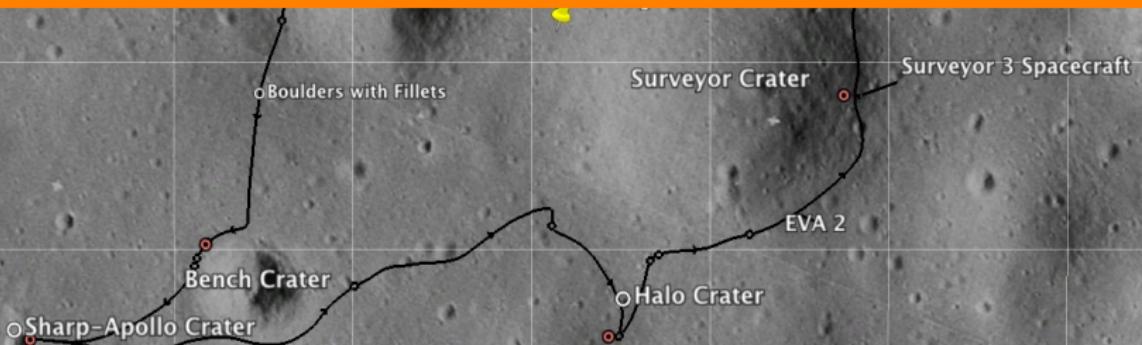


Image NASA / USGS

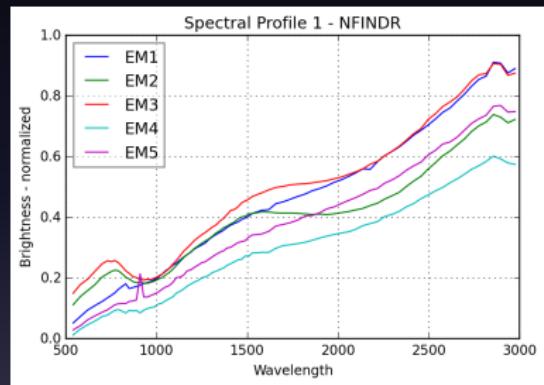
168 m

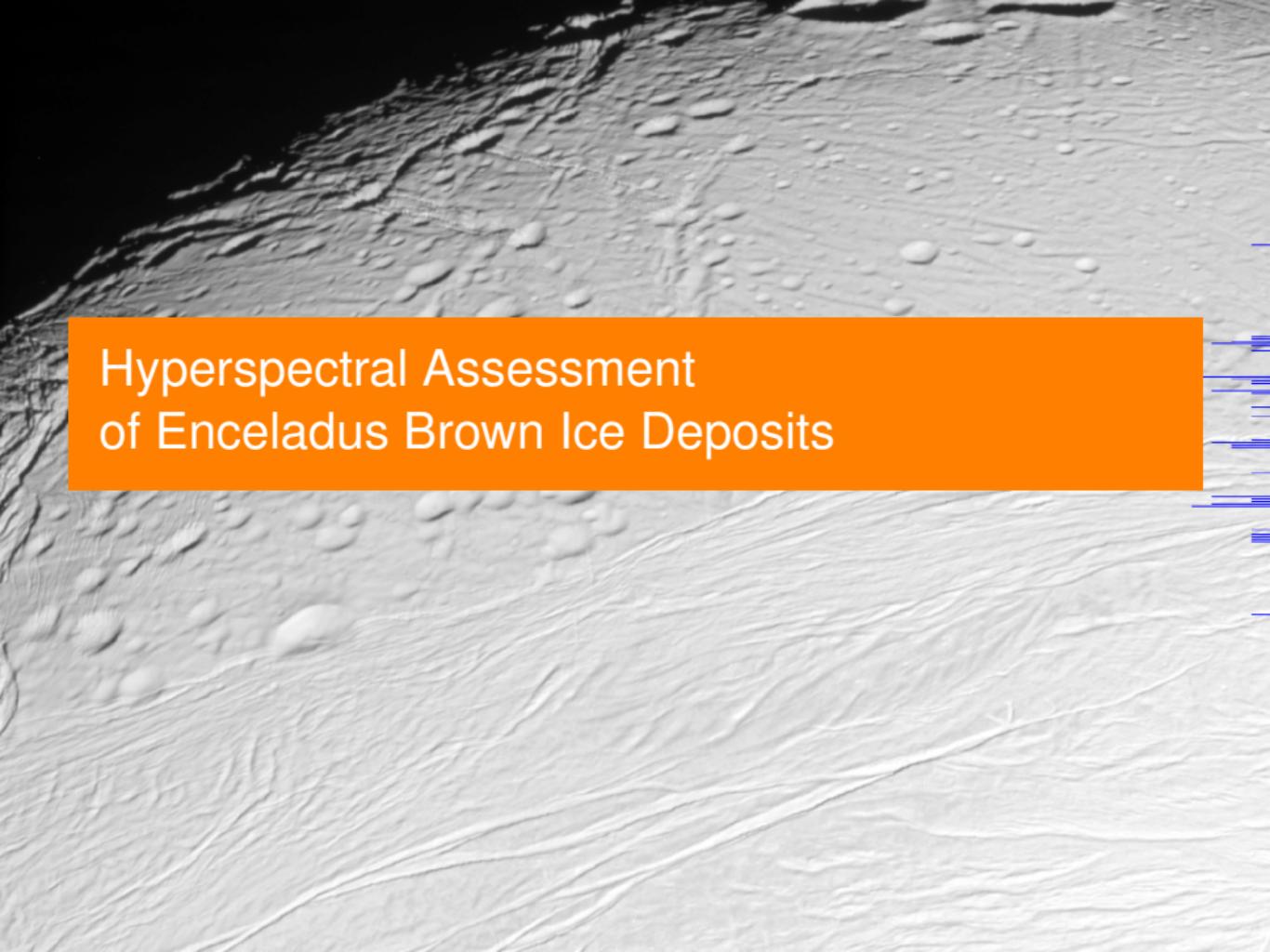


3°01'37.20" S 23°27'51.46" W elev -1427 m eye alt -706 m

Apollo 12 landing site

- Push resolution
- Chandrayaan-1 M³
- Hyperspectral
- Maybe Kaguya
- Connect with LSR

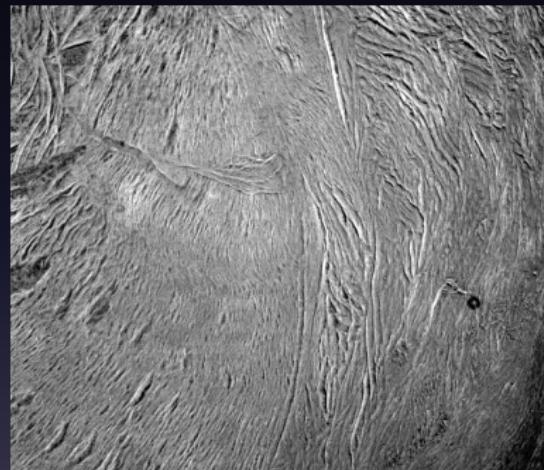


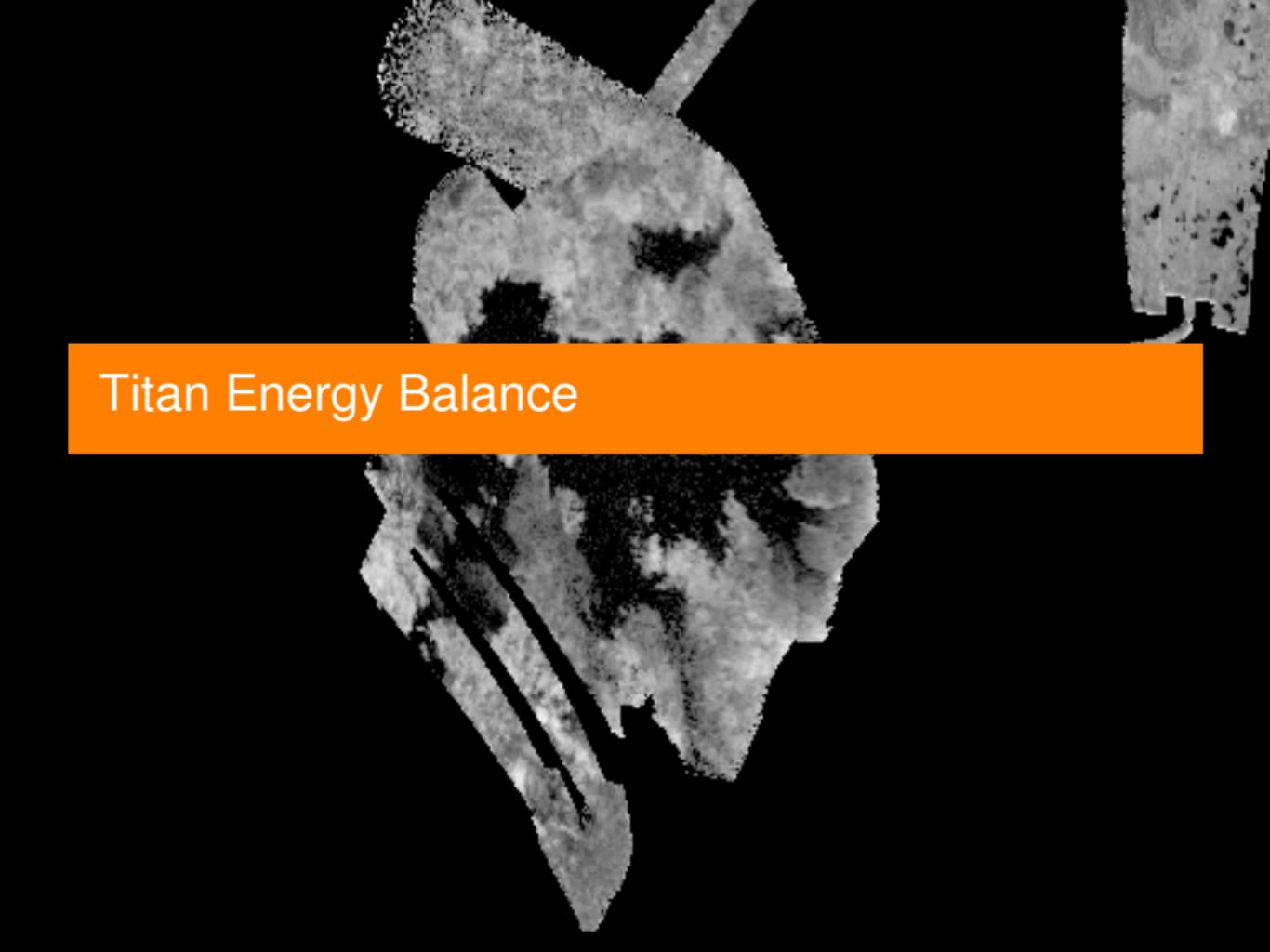
The background of the slide is a grayscale photograph of the surface of the moon Enceladus. The surface is covered in numerous craters of varying sizes and some linear features, possibly fractures or ridges. An orange rectangular box is positioned in the upper left quadrant of the image, containing the title text.

Hyperspectral Assessment of Enceladus Brown Ice Deposits

Enceladus brown ice deposits

- Cassini Probe
- Hyperspectral IR
- IDP?
- High C dust: Vesta?
- Saturn E-ring?
- U of Milano

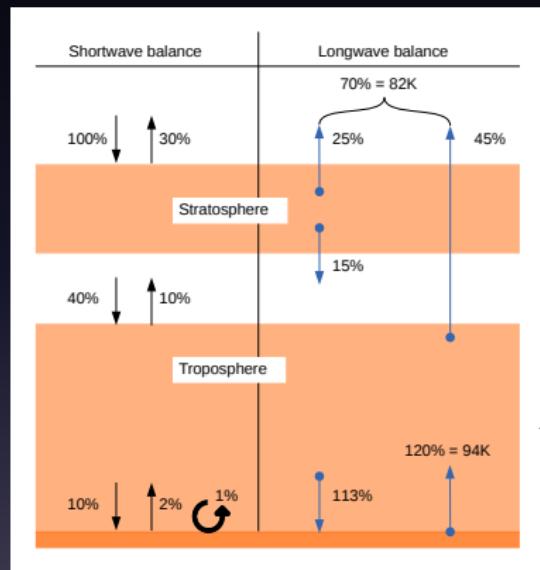




Titan Energy Balance

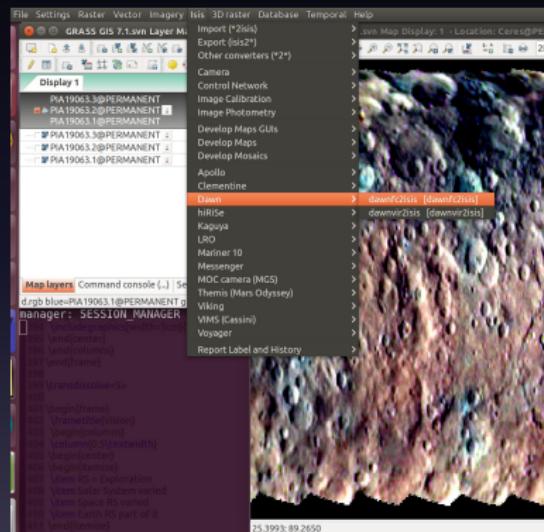
Titan Energy Balance

- Cassini Probe
- IR VIMS Radar
- GCM constraints
- GCM for validation
- 2017 end of mission
- not another soon
- initial work only



Future

- Titan EB
- Magellan SAR PS
- SPICE Kernels API
- ISIS-GRASS part 2



Vision

- RS = Exploration
- Solar System varied
- Space RS varied
- Earth RS part of it



Questions