Satellites and McIDAS Output in WebVR

McIDAS Users Group Meeting
September 16, 2019
Jerrold Robaidek & Clayton Suplinski

https://www.ssec.wisc.edu/datacenter/wxsats/

Acknowledgments

- SSEC 2022 (SSEC Equity Tech Camp) - Margaret Mooney
- 2018 Baldwin Wisconsin Idea Endowment
- Akatsuki project - Sanjay Limaye

Background

WxSatS - Weather Satellites at SSEC

- WxSatS is a web-based 3D visualization of satellites, planets, and more.
- Goal: Education and Outreach
- Supported on many browsers including:
  - Chrome
  - Firefox
  - Oculus Browser

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VR Devices

Most any 6 DOF* VR device that can run a web browser will likely work, but only Oculus Quest has been tested.

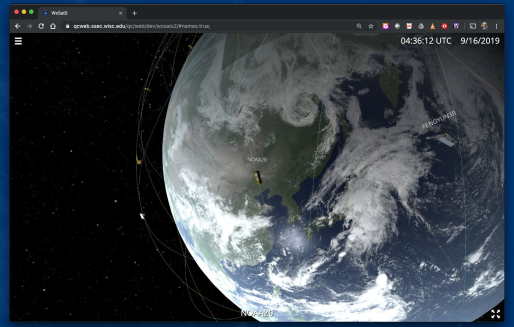
Oculus Quest

~$400 USD for 64 GB version

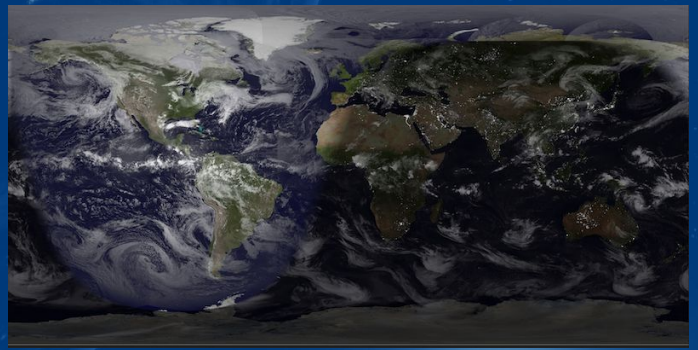
*6 Degrees of freedom

How does this use McIDAS?

- The coordinates of the satellites are calculated using two-line elements files with the NAVCALC command in McIDAS-X.



- The full-globe cloud composites are generated using McIDAS.



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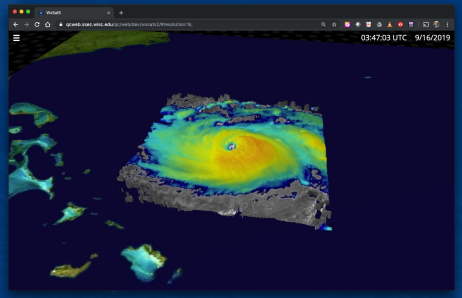
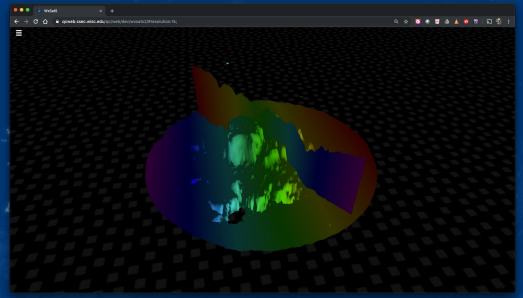
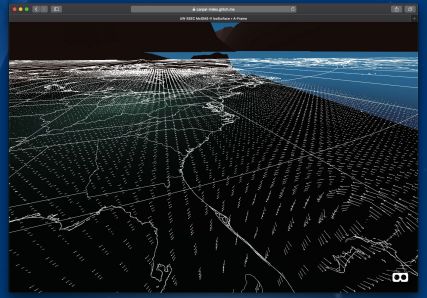
How does this use McIDAS?

- Several additional features are currently in development that use McIDAS.
  - Animating hurricanes / cloud systems in 3D with cloud-top heights.
  - Exporting isosurfaces from McIDAS-V.
  - Displaying wind vectors in 3D.







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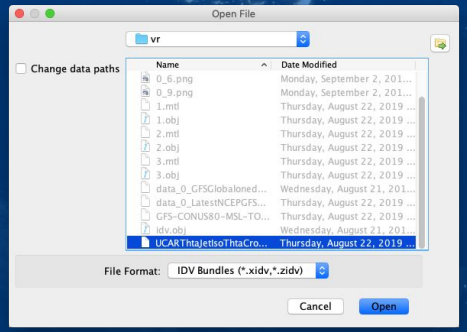
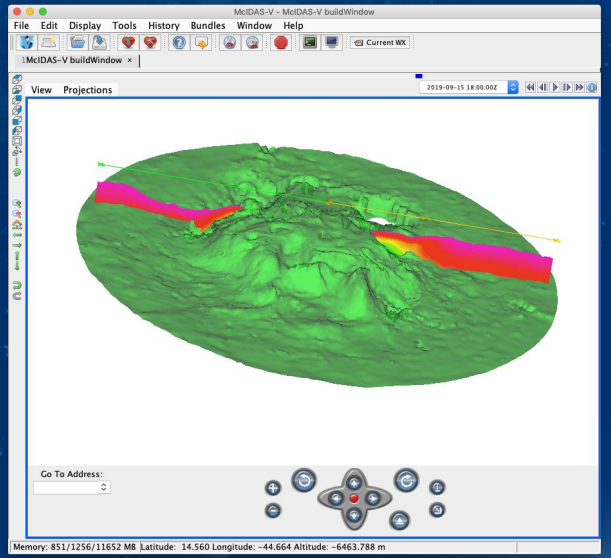
Generating a .obj file in McIDAS-V

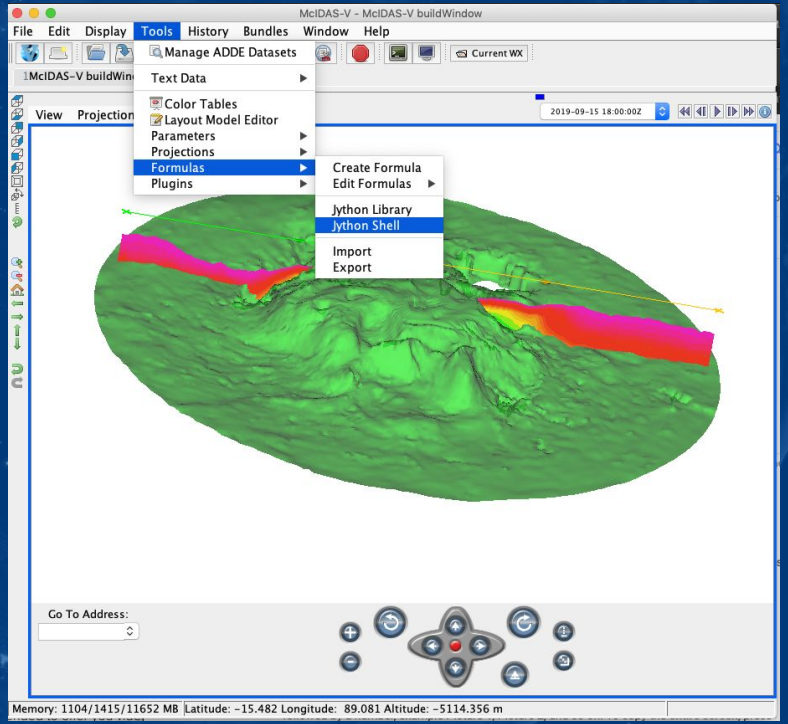
- Thanks to Tom Rink and Jon Beavers
- Create Isosurface





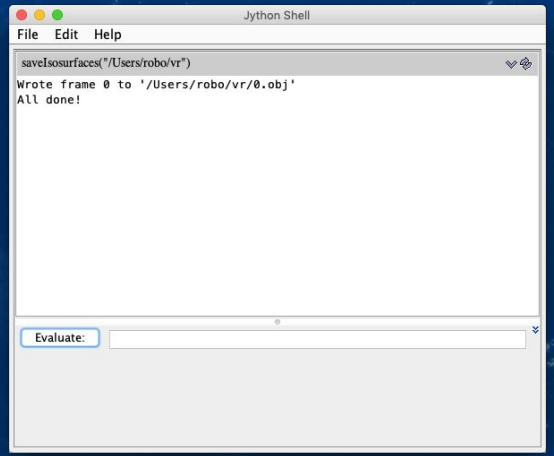
Generating a .obj file in McIDAS-V

- Save OBJ



Generating a .obj file in McIDAS-V

- Save OBJ



(.OBJ)

Generating a .obj file in McIDAS-V

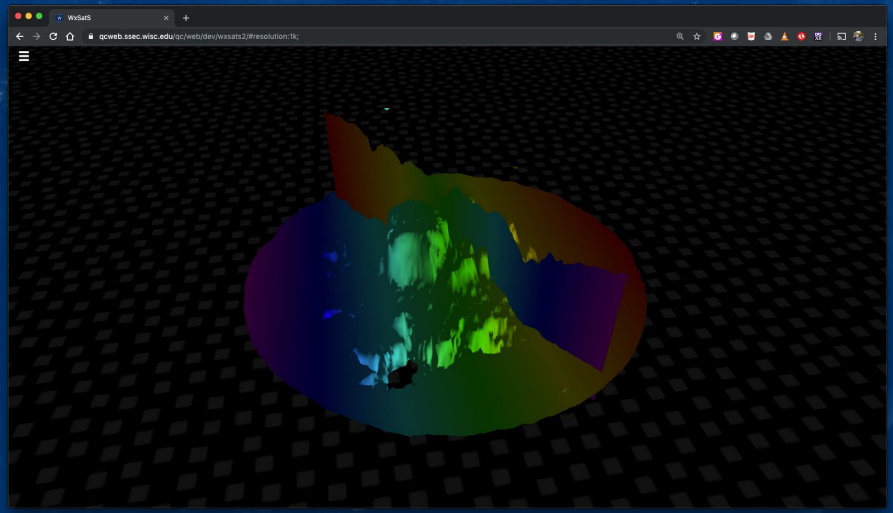
- “Fix” OBJ

(.OBJ) → 

Use blender to decrease number of vertices

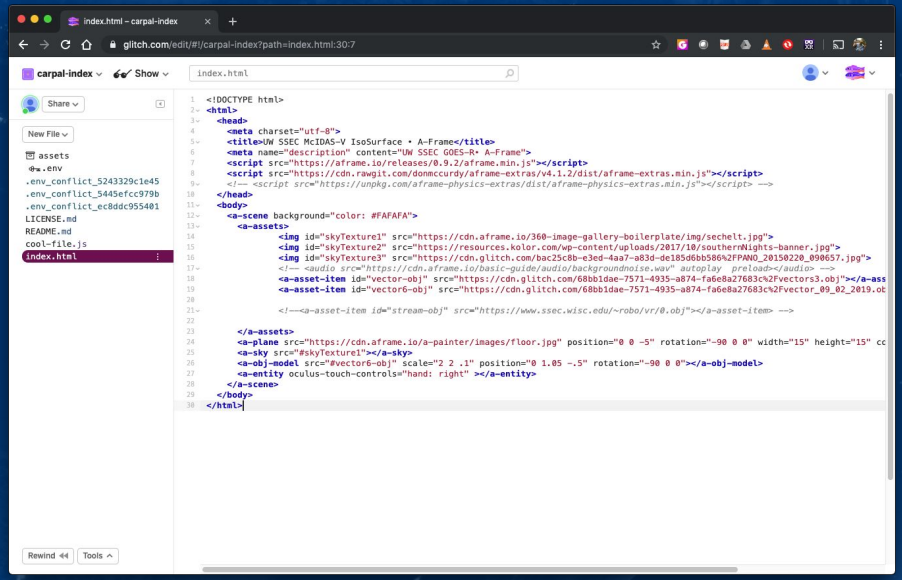
Load into VR

- WxSatS



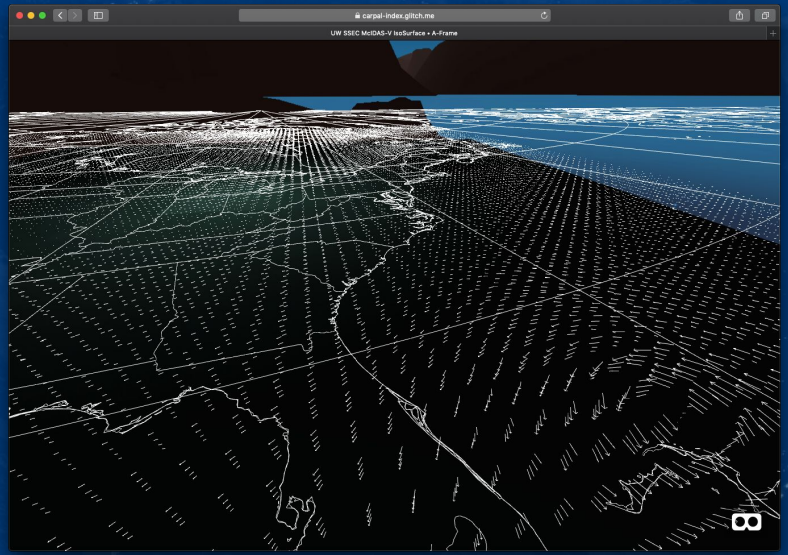
Load into VR

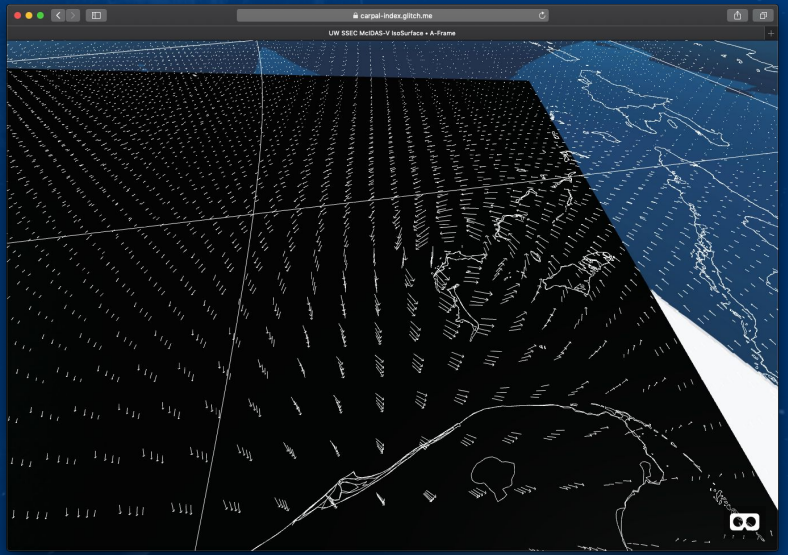
- Or roll your own viewer using AFRAME



Load into VR

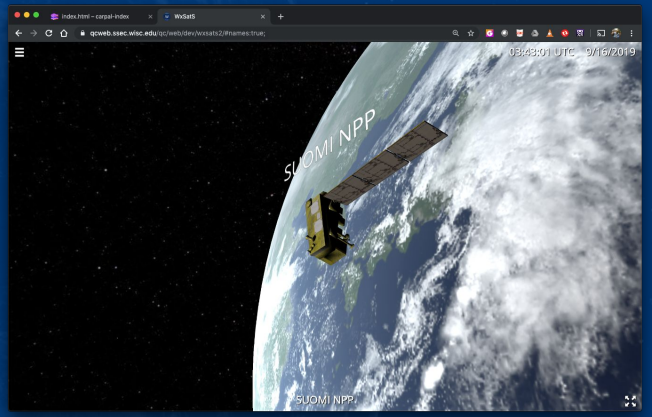
- Or roll your own viewer using A-FRAME



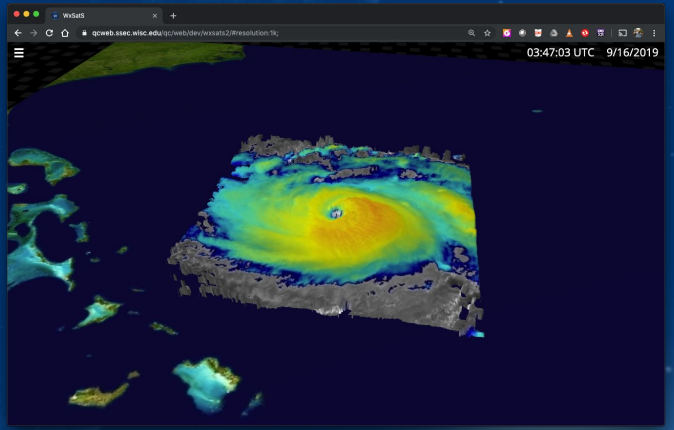


Demo Time

- WxSatS - Received Satellites



- Hurricane Dorian Cloudtop heights from CLAVR-x with sandwich product as a texture



Come up and try it out at the ice breaker.