

A blue-tinted satellite image of Earth from space, showing cloud patterns and landmasses. The image serves as the background for the slide.

Satellites and McIDAS Output in WebVR

McIDAS Users Group Meeting

September 16, 2019

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<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

VR Devices

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



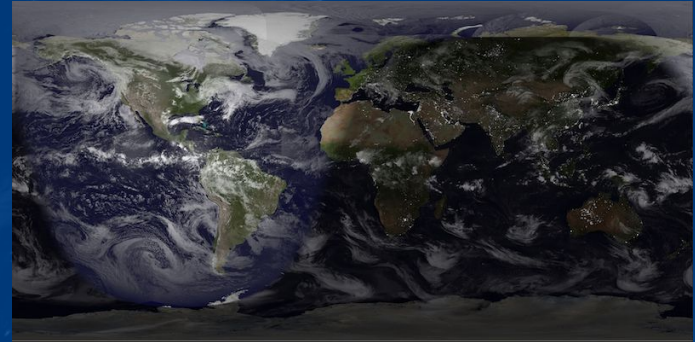
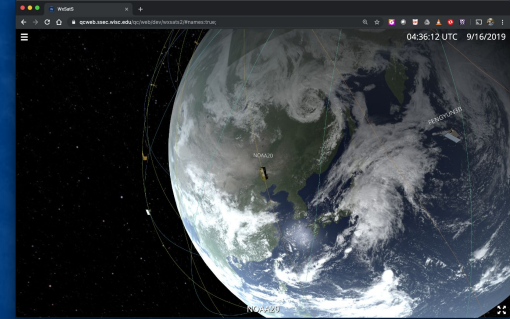
Oculus Quest

~\$400 USD for 64 GB version

*6 Degrees of freedom

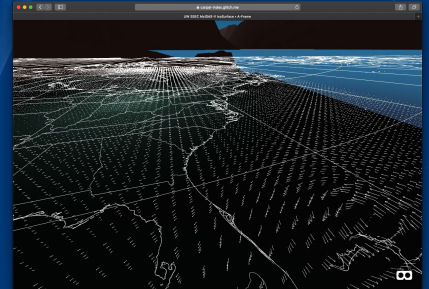
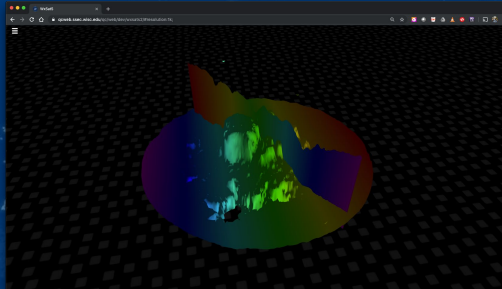
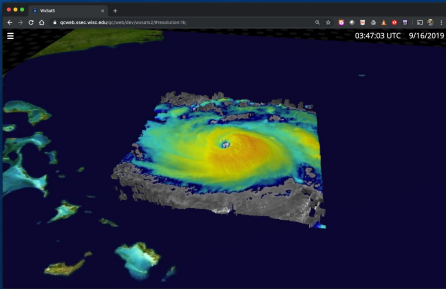
How does this use McIDAS?

- 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.



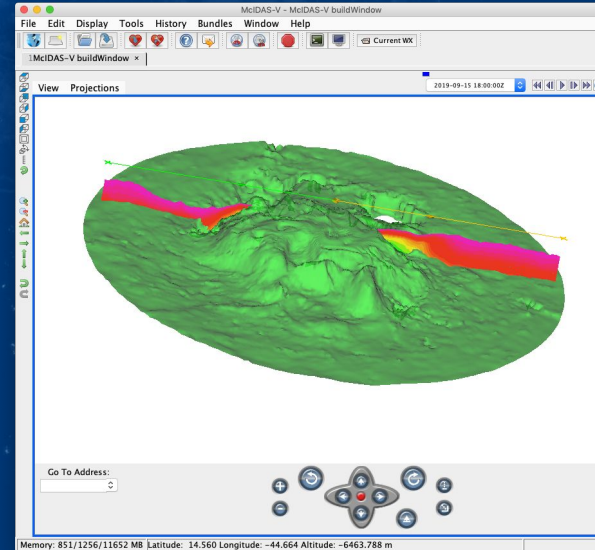
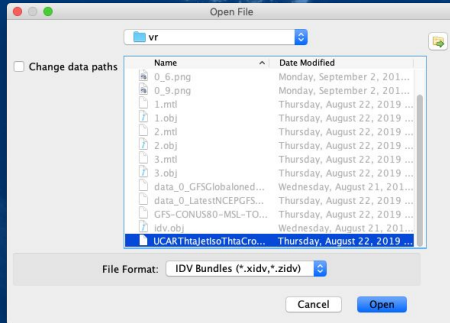
How does this use McIDAS?

- 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.



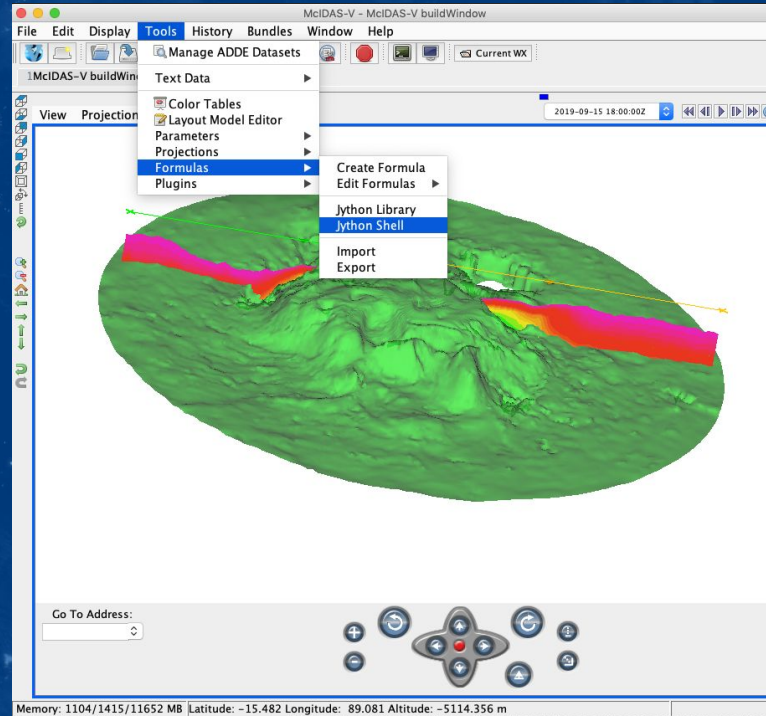
Generating a .obj file in McIDAS-V

- Thanks to Tom Rink and Jon Beavers
- Create Isosurface



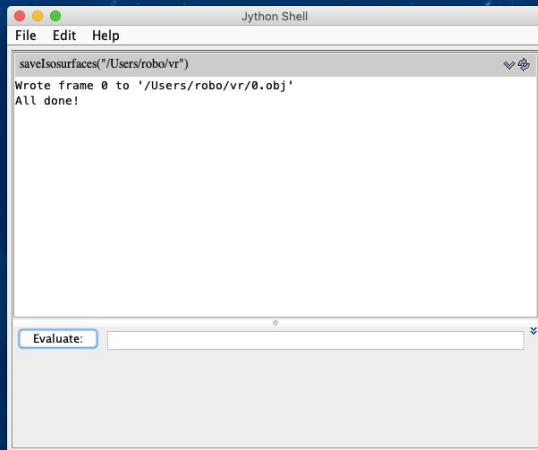
Generating a .obj file in McIDAS-V

- Save OBJ



Generating a .obj file in McIDAS-V

- Save OBJ



→ (.OBJ)

Generating a .obj file in McIDAS-V

- “Fix” OBJ

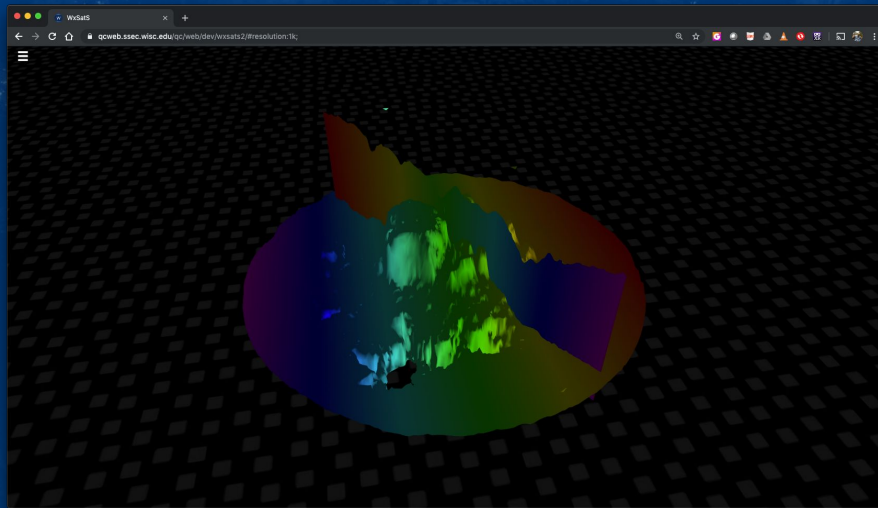
(.OBJ)



Use blender to decrease number of vertices

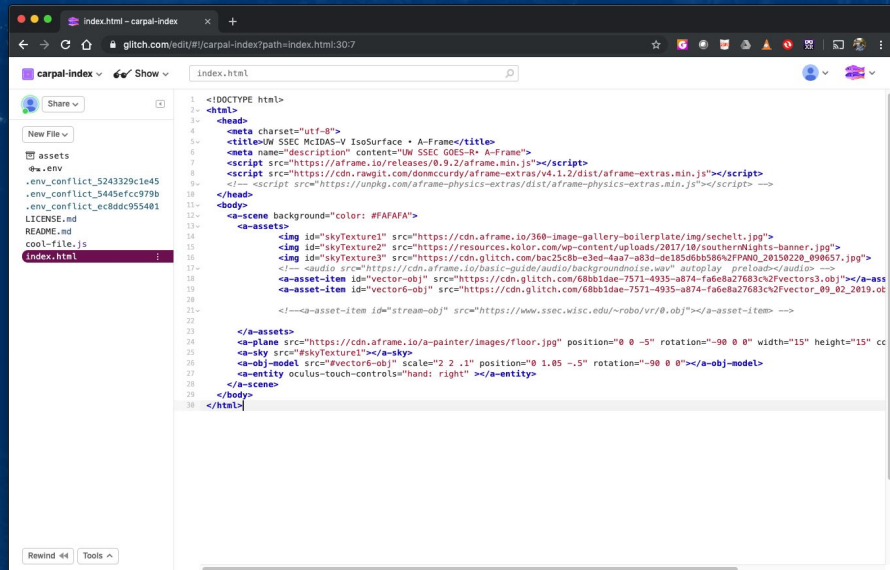
Load into VR

- WxSatS



Load into VR

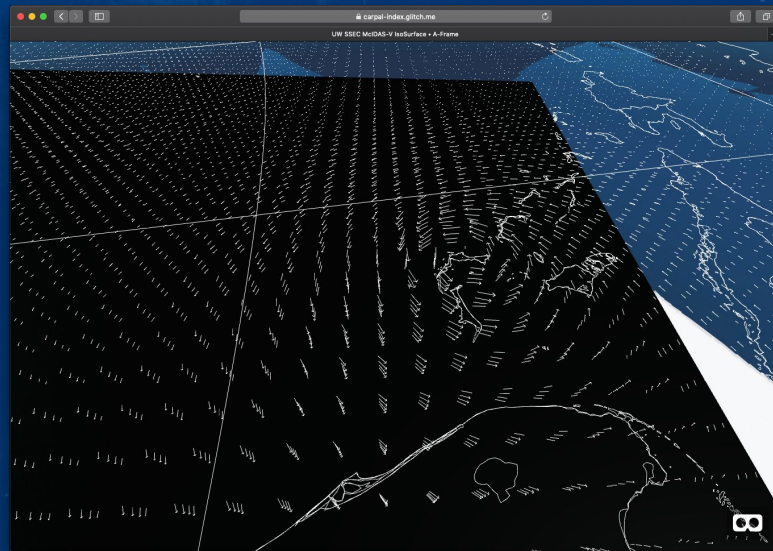
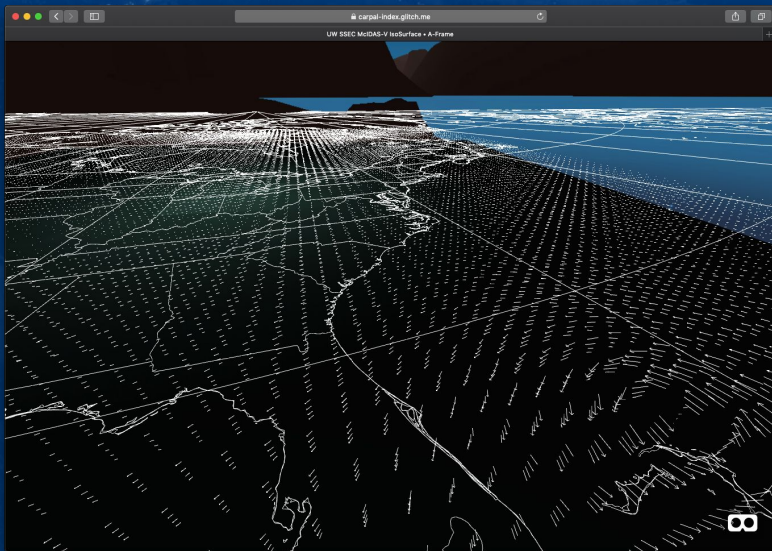
- Or roll your own viewer using AFRAME



```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <meta charset="utf-8">
5     <title>UW SSEC McIDAS-V IsoSurface • A-Frame</title>
6     <meta name="description" content="UW SSEC GOES-R• A-Frame">
7     <script src="https://aframe.io/releases/0.9.2/aframe.min.js"></script>
8     <script src="https://cdn.rawgit.com/donmccurdy/aframe-extras/v4.1.2/dist/aframe-extras.min.js"></script>
9     </-- <script src="https://unpkg.com/aframe-physics-extras/dist/aframe-physics-extras.min.js"></script -->
10   </head>
11   <body>
12     <a-scene background="color: #FAFAFA">
13       <a-assets>
14         
15         
16         
17         <!-- audio src="https://cdn.aframe.io/basic-guides/audio/backgroundnoise.wav" autoplay preload="audio" -->
18         <a-asset-item id="vector-obj" src="https://cdn.glitch.com/68bb1dae-7571-4935-a874-fa6e8a27683c2fvector3.obj"></a-asset-item>
19         <a-asset-item id="vector6-obj" src="https://cdn.glitch.com/68bb1dae-7571-4935-a874-fa6e8a27683c2fvector6.obj"></a-asset-item>
20         <!-- <a-asset-item id="stream-obj" src="https://www.ssec.wisc.edu/~robo/vr/0.obj"></a-asset-item -->
21       </a-assets>
22       <a-plane src="https://cdn.aframe.io/a-painter/images/floor.jpg" position="0 0 -5" rotation="-90 0 0" width="15" height="15" cc
23       <a-sky src="skyTexture1"></a-sky>
24       <a-obj-model src="vector6-obj" scale="2 2 .1" position="0 1.05 -.5" rotation="-90 0 0"></a-obj-model>
25       <a-entity oculus-touch-controls="hand: right"></a-entity>
26     </a-scene>
27   </body>
28 </html>
```


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.

