

Interactive Access and Visualization of Large Scale Image Data

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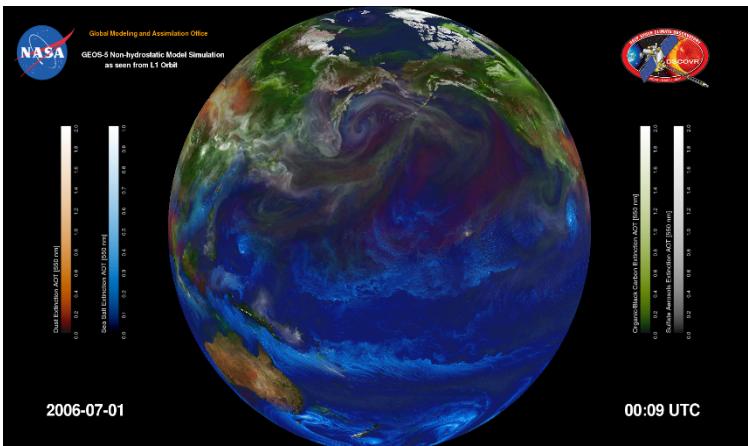
Managing massive image data

- A big challenge in different domains:
 - Simulations
 - High resolution acquisition devices (light sources, microscopes)
 - Drones/airborne/satellites
- Usability is often limited by network bandwidth and memory availability
- A possible solution:
 - Use multiresolution data layouts to access data more efficiently
 - Use streaming technologies to enhance the usability and flexibility of the visualization and analysis workflows

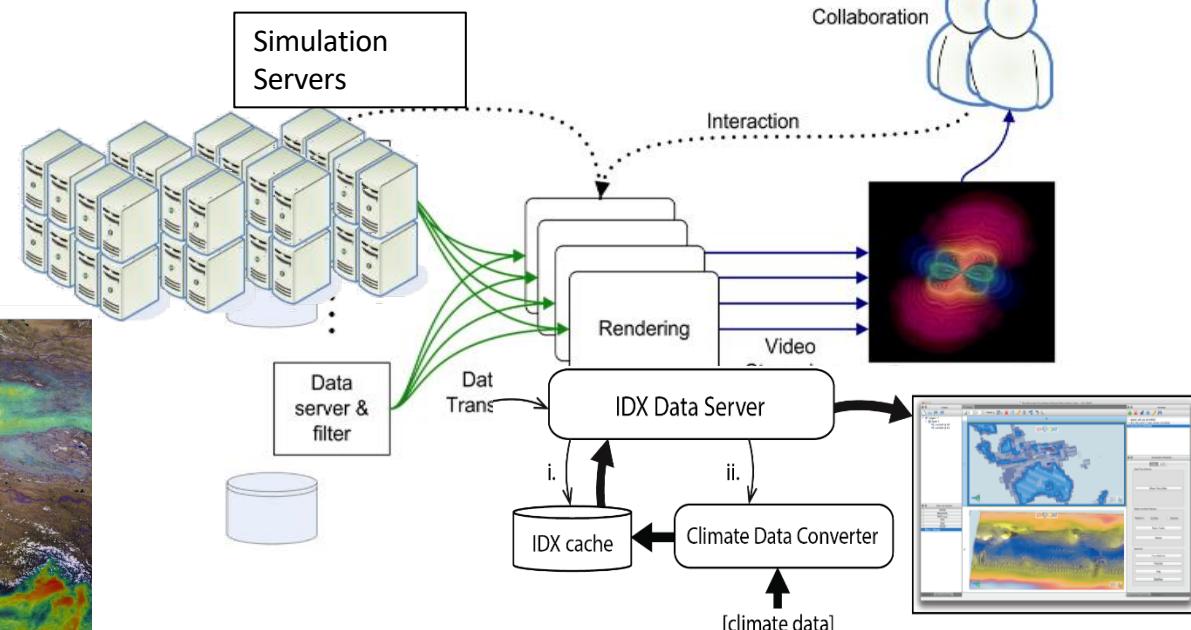
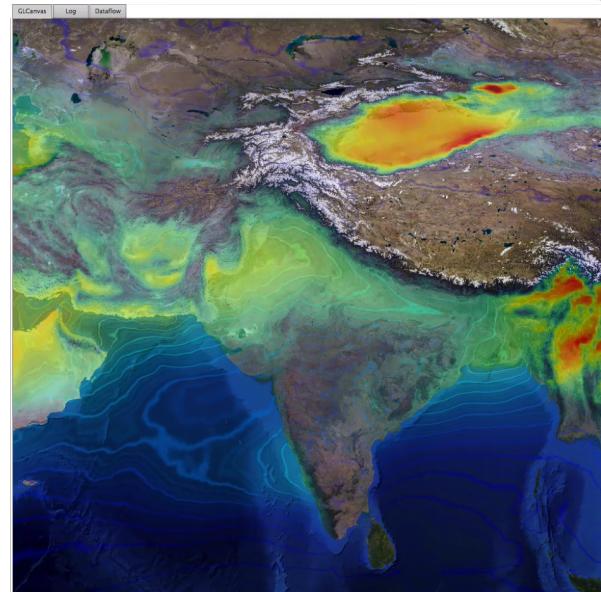
Scalable Deployment: Exploration of 3.5TB of Weather/Climate Data in Real Time

Workflow

- Data creation
- Data Management
- Processing
- Analysis
- Visualization



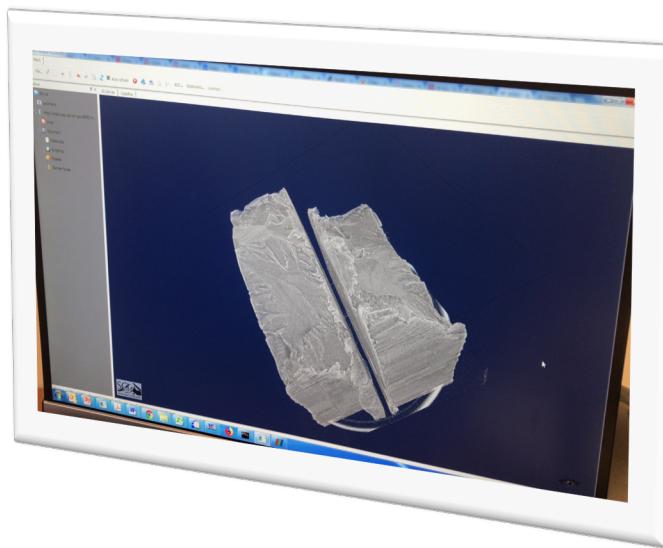
- 7km GEOS-5 “Nature Run”
- 1 dataset, 3.5 PB
- theoretically: openly accessible
- practically: precomputed pics



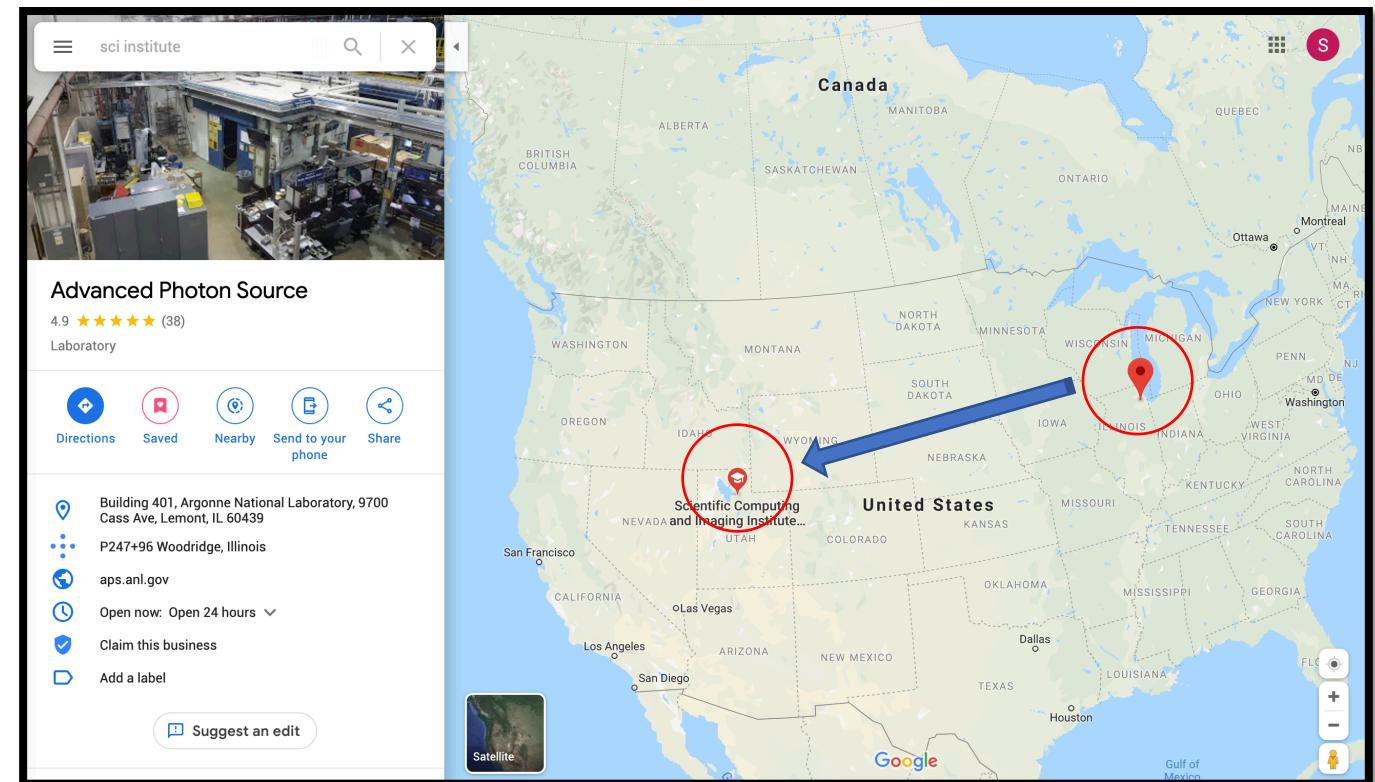
Distributed Resources

- 3.5 PB of *data store in NASA*
- *Primary ViSUS server in LLNL*
- *Secondary ViSUS server in Utah*
- *Clients connect remotely*
- *Work without additional HPC resources*

High Performance Data Movements for Real-Time Access to Large Scale Experimental Data (Dockerized server)



- Using a desktop client (or a webviewer)
Prof. Ashley Spears was able to see the data being acquired at APS from her office at the University of Utah



NEON AOP data

- NEON has a large amount of data that is shared with the community through their **data portal**
- There exist **APIs** to download those data in bulk
(per site, per year, per data product, now also by area)
- For some data, such as sensor measurements, the portal provides an **interactive** navigation system
- For others, like **Airborne Observation Platforms data**, there is a long list of image files...
- There is a need to present all AOP data interactively, where the users can preview, navigate, and select/access/download the data they need



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Showing 1 to 100 of 20,850 entries

AOP data

Integration with NEON data portal



The screenshot shows the NEON Data Portal homepage. At the top, there is a dark blue navigation bar with three tabs: "NEON SCIENCE" (highlighted in white), "DATA PORTAL", and "BIOREPOSITORY". Below the navigation bar is a secondary horizontal menu with icons for a house (Home), a person (About), a download (Download Data), a gear (Resources), and a contact link (Contact Us). The main content area features a large, light gray rectangular box with the text "Loading data product..." centered in it. Below this box is a thin horizontal line. At the bottom of the page, there is a footer section containing social media links (Facebook, Twitter, LinkedIn, YouTube) and a "Sign Up for Our Newsletter" button. To the right of these links are links to "Contact", "Careers", "FAQ", "Media", and "Terms of Use". On the far right of the footer is a small vertical icon consisting of four horizontal bars of increasing length from top to bottom. At the very bottom of the page, there is a small note: "The National Ecological Observatory Network is a major facility fully funded by the National Science Foundation. Any opinions, findings and conclusions or recommendations expressed in this material do not necessarily reflect the views of the National Science Foundation." To the right of this note is the copyright notice "© 2019 Battelle".

<https://www.youtube.com/watch?v=09DWwEhUIWc>

