



Uncovering the Meaning of Data

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SIAM CSE15
March 18, 2015



Exploration



Exploring More Effectively

Exploring More Effectively

- Integration
- Interaction

Integration

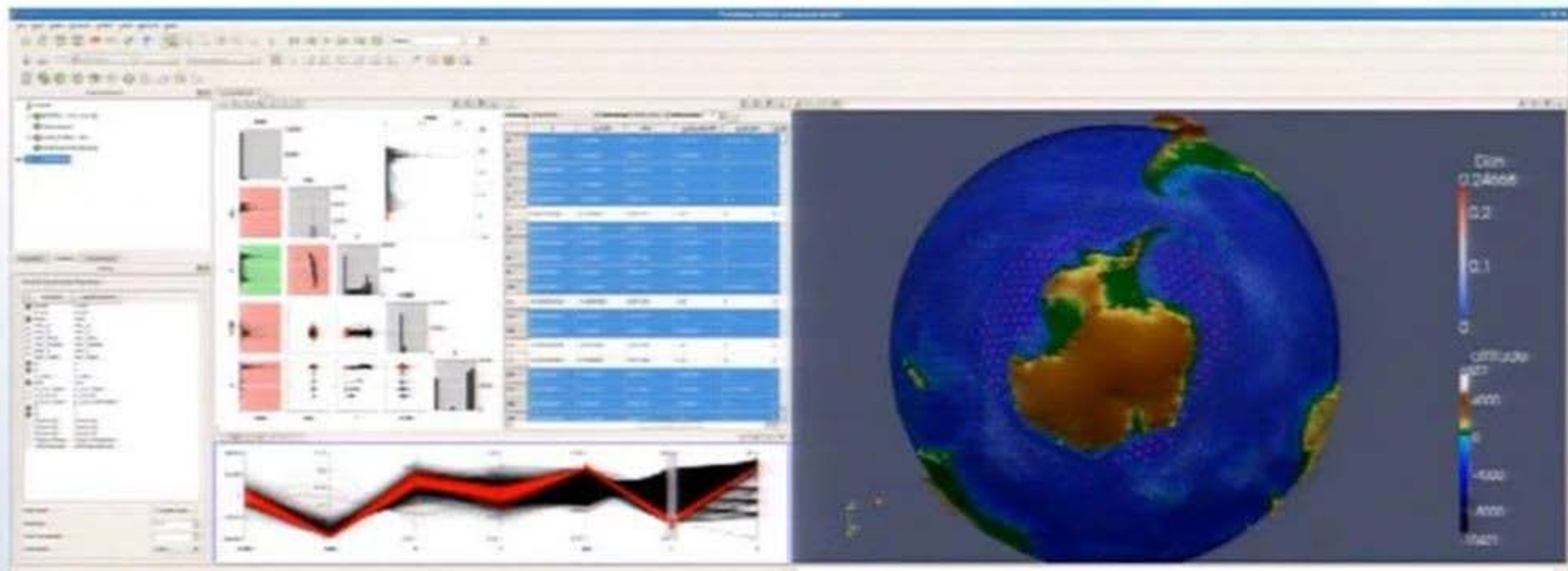
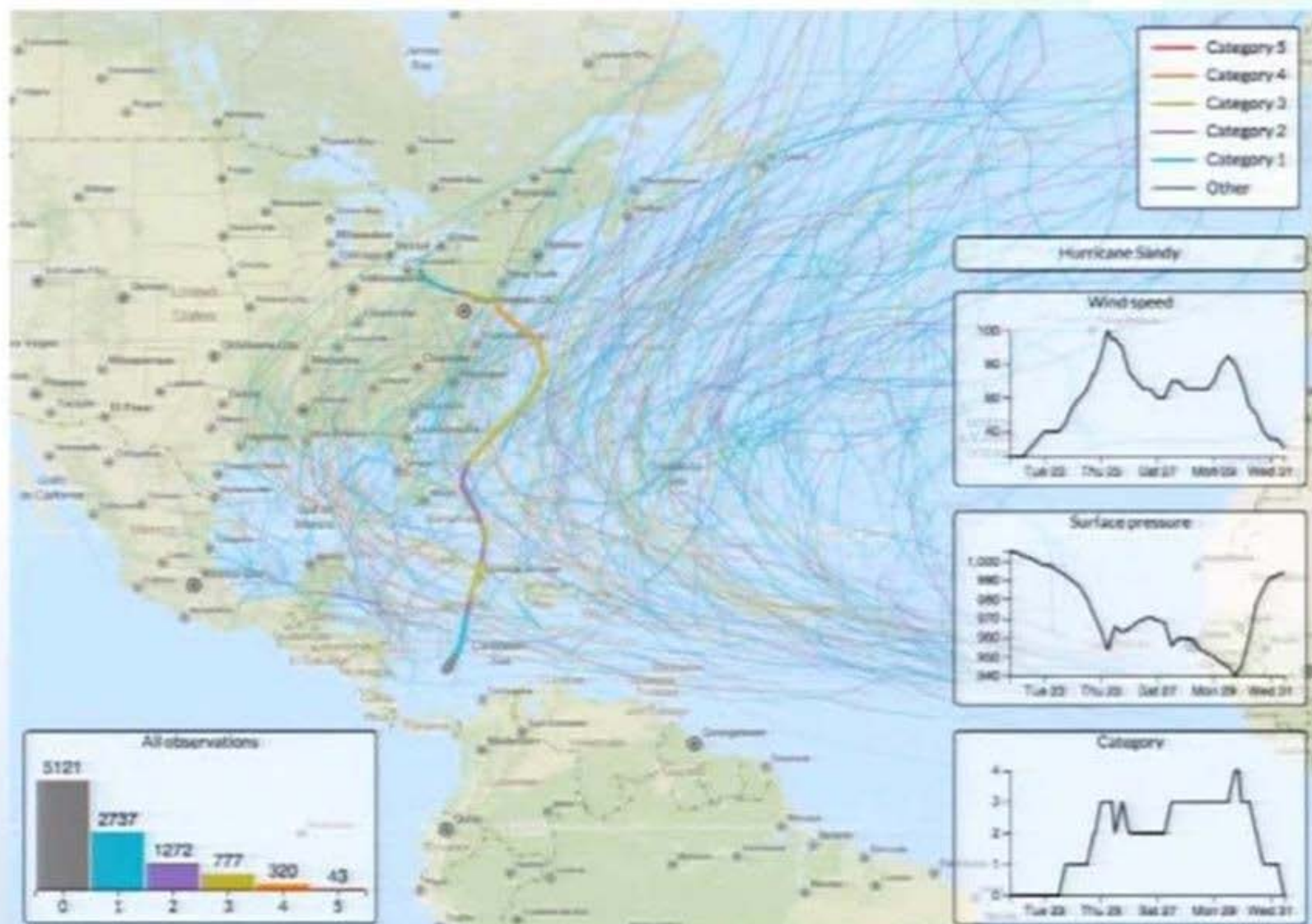


Image Credit: Deutsches Klimarechenzentrum GmbH



Hurricane Explorer: <http://opengeoscience.github.io/geojs/examples/hurricanes/>

█ Guinea
█ Liberia
█ Sierra Leone
█ Nigeria
█ Dem. Rep. Congo
█ Senegal
█ Ivory Coast
█ United States
█ Mali



The ongoing Ebola outbreak in West Africa is believed to have started on December 6, 2013, in Guinean Guinea where a 2-year-old boy died of the disease. A short time later, several members of his family, as well as the doctor treating him, also fell ill.





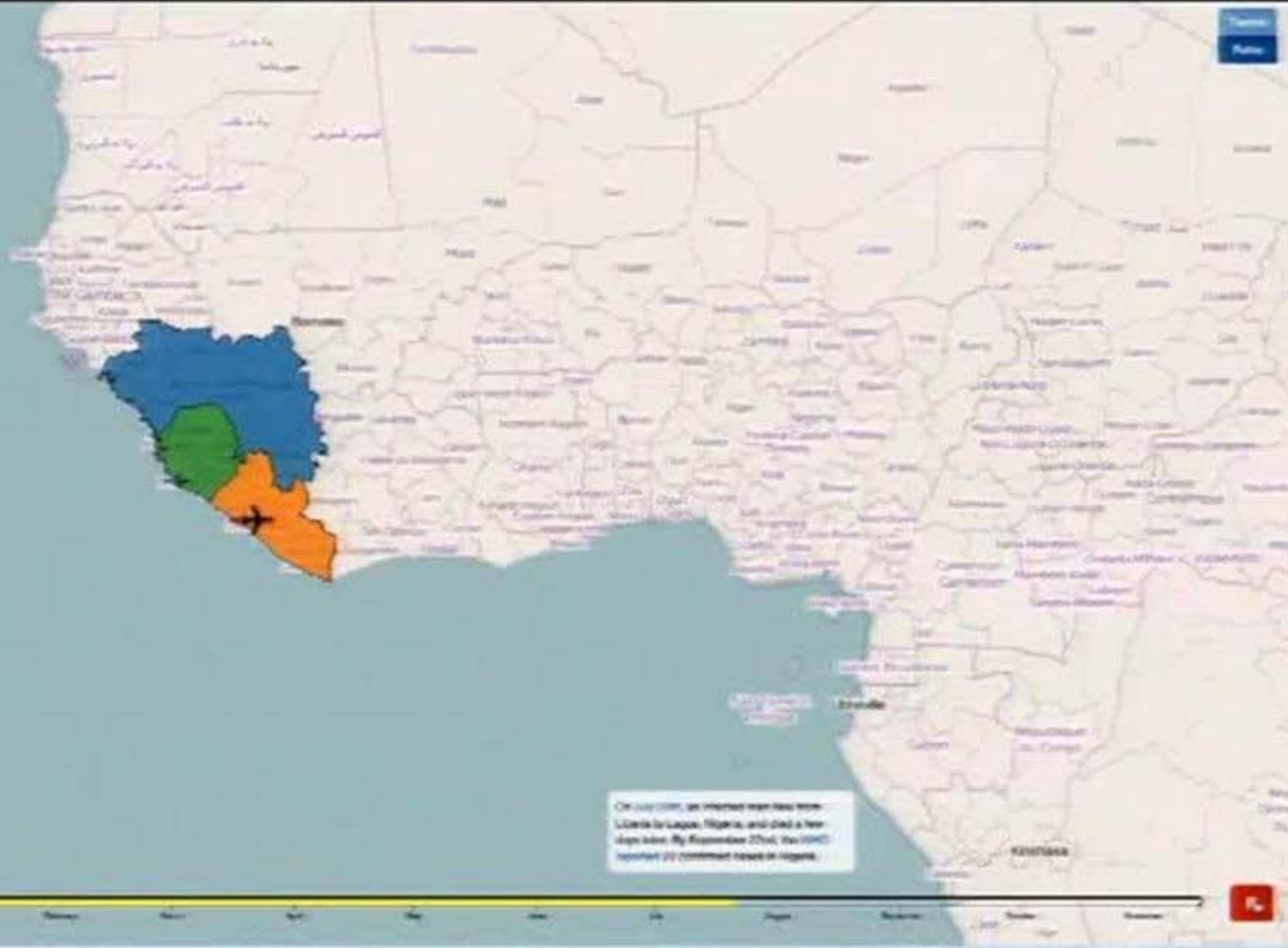
- Guinea
- Liberia
- Sierra Leone
- Nigeria
- Cent. Rep. Congo
- Senegal
- Ivory
- United States
- Mali



By late April of 2014, the outbreak had spread into Liberia from Guinea, & 10-12 hours on March 1st stated that the outbreak in Guinea had increased to 135 including 66 deaths.



- Senegal
- Gambia
- Sierra Leone
- Nigeria
- Cent. Rep. Congo
- DRC
- Ivory Coast
- United States
- Mali



- Guinea
- Liberia
- Sierra Leone
- Nigeria
- Dem. Rep. Congo
- Senegal
- Ivory
- United States
- Map



The 2002-2003 West African Ebola Virus (EBOV) outbreak in the Democratic Republic of Congo (DRC) was the largest outbreak of EBOV in Africa. It is believed that the virus was introduced to the DRC from the west, and it was probably the outbreak in Liberia.

- Chad
- Chad Lake
- Niger
- Chad. High. Congo
- Senegal
- Sierra
- United States
- Mal



- Guinea
- Liberia
- Sierra Leone
- Nigeria
- Dem. Rep. Congo
- Senegal
- Spain
- United States
- Mali



On 11 September 2011, a small airplane from the Democratic Republic of Congo was hijacked near the city of Kinshasa. On 12 September 2011, the hijacked aircraft landed at a nearby airport. The plane was then taken to the United States and the hijackers were released. On 13 September 2011, the hijacked aircraft was confirmed to be the same aircraft that was hijacked on 11 September 2011.

- Gabon
- Liberia
- Sierra Leone
- Nigeria
- Dem. Rep. Congo
- Senegal
- Spain
- United States
- Mali



On September 21, 2014, a flight arrived in Dallas-Fort Worth, Texas. The initial emergency call to landing the flight showed no signs of distress. On September 21, the jet fell and caught fire at a major airport. The two crew members who had no conditions confirmed, he returned to the hospital several days later. On September 20th, initial tests confirmed that he had contracted Ebola.

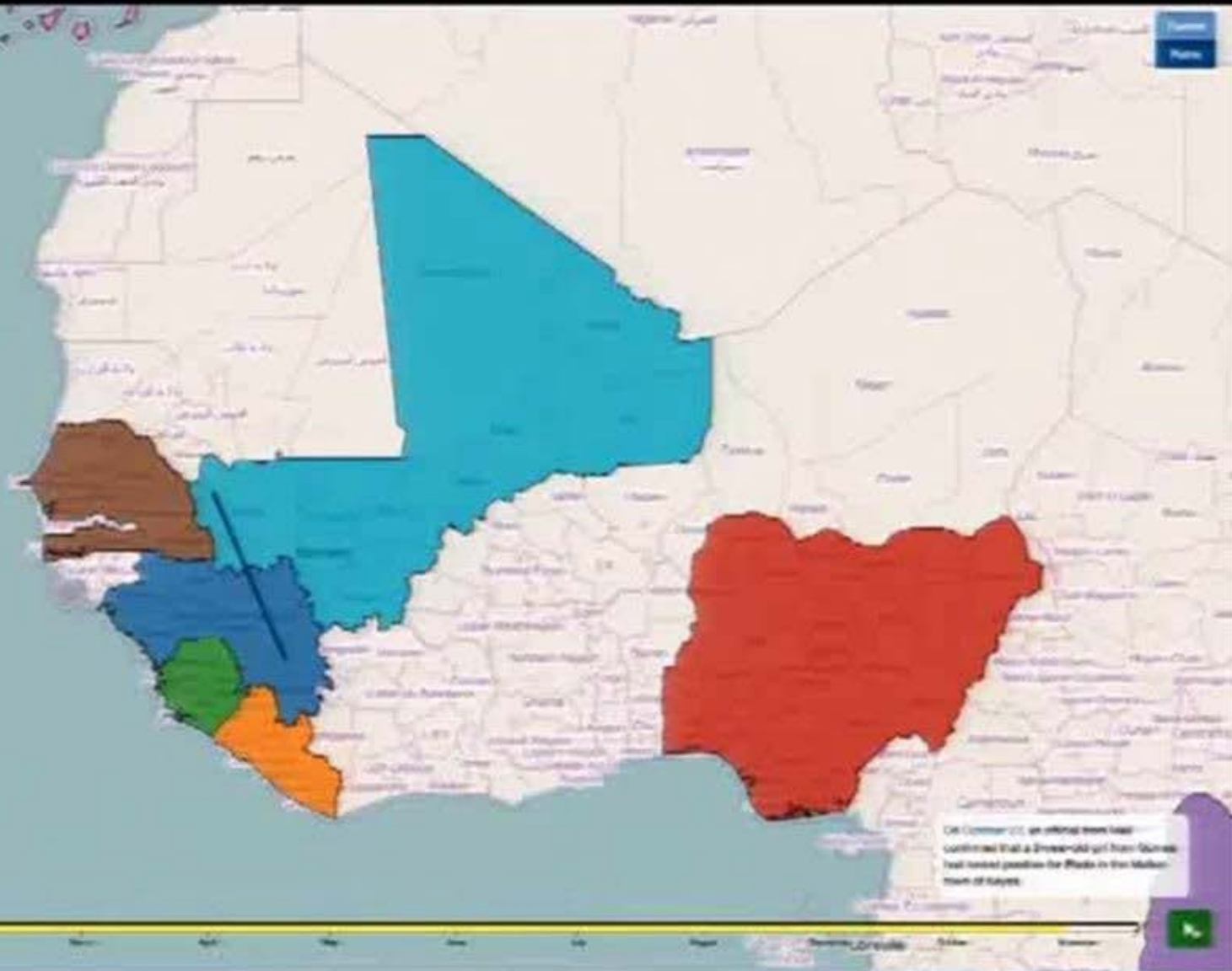


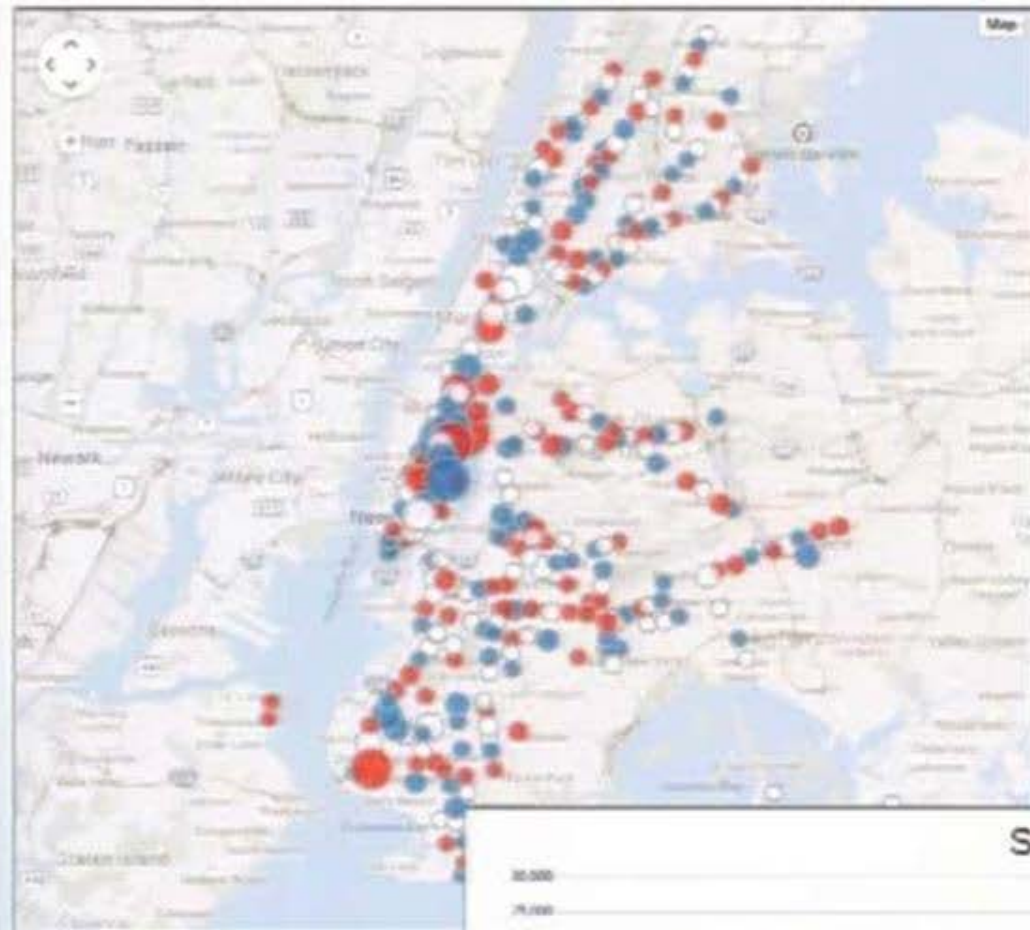
- Blue
- Orange
- Green
- Red
- Purple
- Brown
- Pink
- Black
- Light Blue



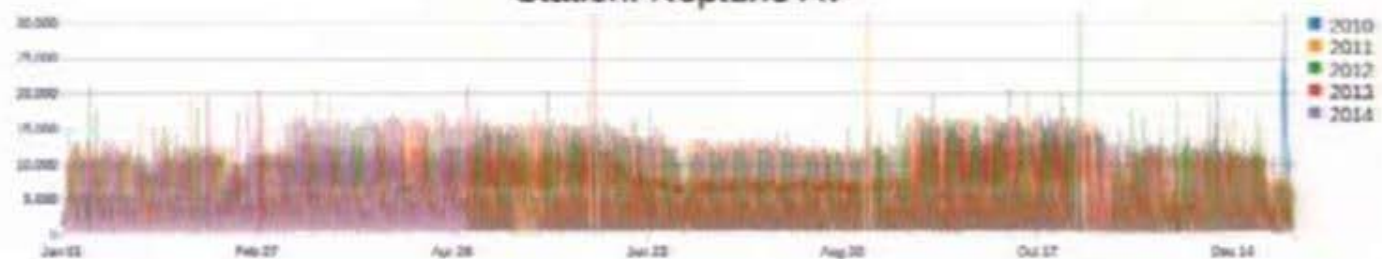
Kitware is an organization that
specializes in a variety of 3D software
and services for the design and
manufacturing industry.

- Guinea
- Liberia
- Sierra Leone
- Nigeria
- Cent. Rep. Congo
- Senegal
- Rwanda
- United States
- Map

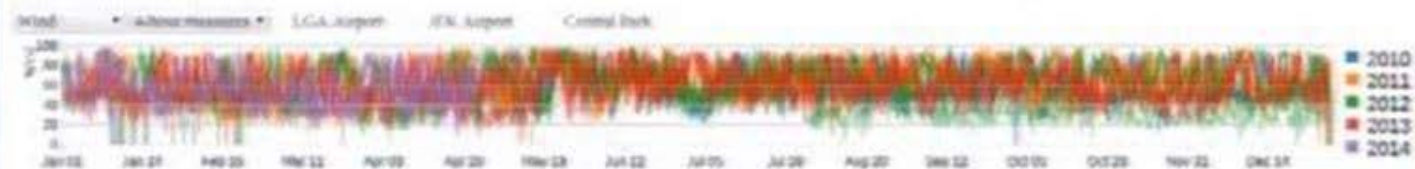




Station: Neptune Av



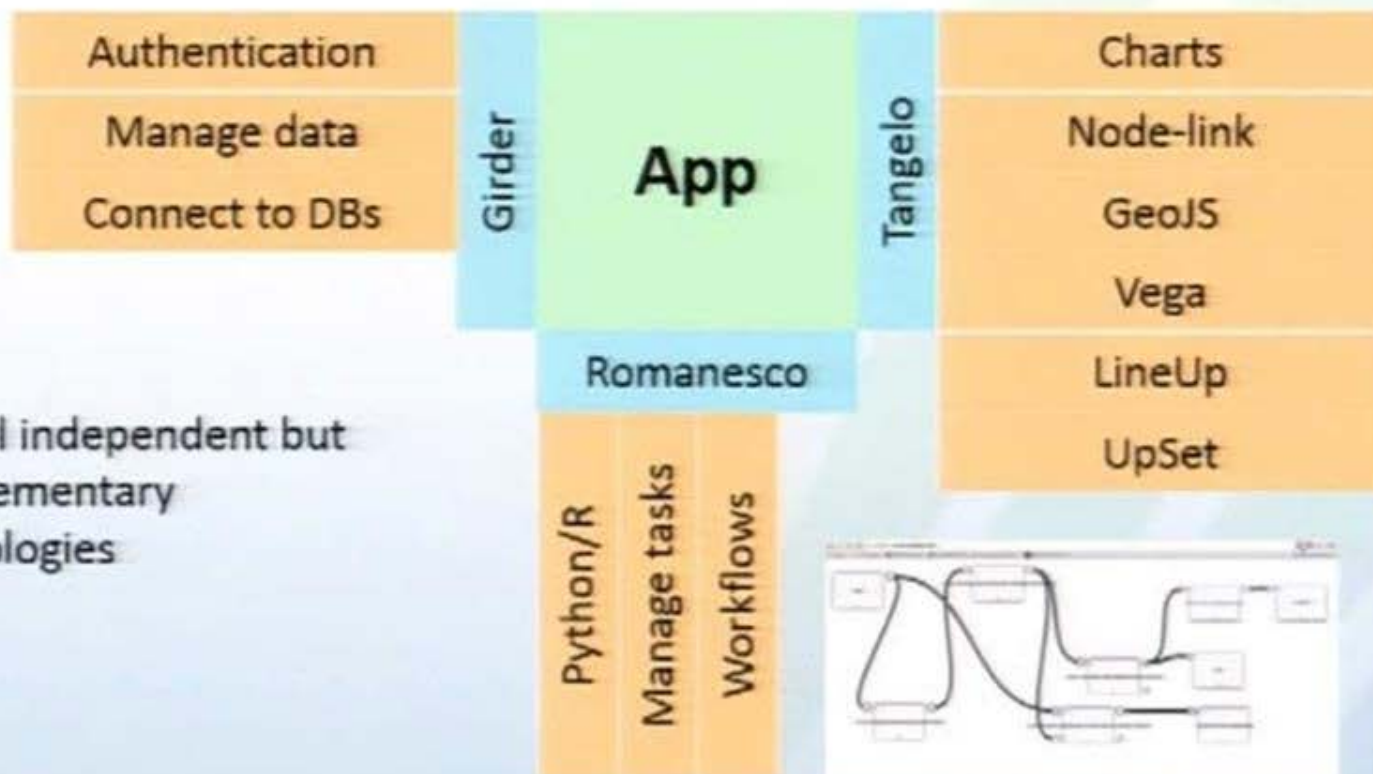
NYC Weather



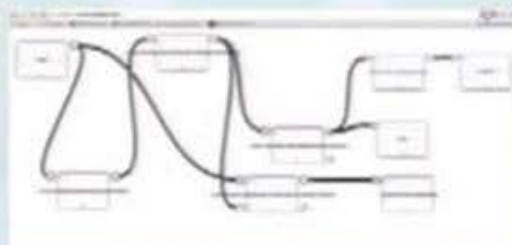




Mix and match functionality



Several independent but complementary technologies



Interaction



ParaView Cinema, SuperComputing 2014

"An Image-based Approach to Extreme Scale In Situ Visualization and Analysis"

Jim Ahrens et al.



Paraview Cinema

In Situ MPAS-Ocean
Image-based Visualization



Earth core

Contour by temperature

t=5.0 temperature

t=10.0 temperature

t=15.0 temperature

t=20.0 temperature

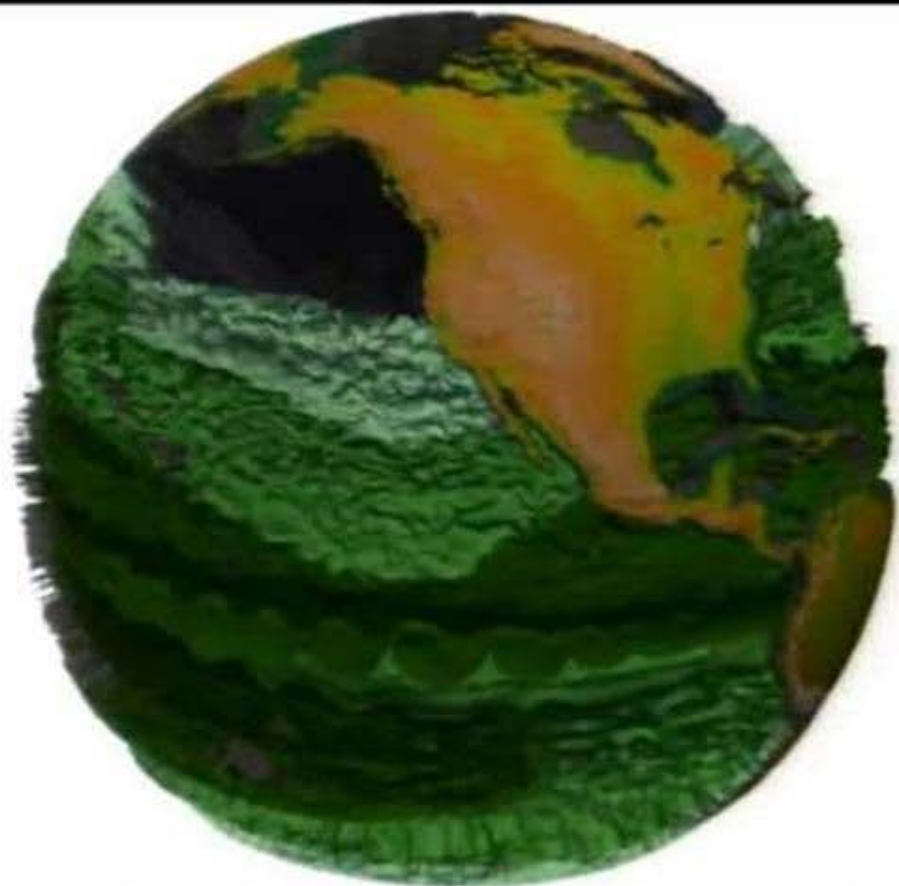
t=25.0 temperature

Contour by salinity

Time 0

Phi 300.0

Theta 115.0



Earth core

Contour by temperature

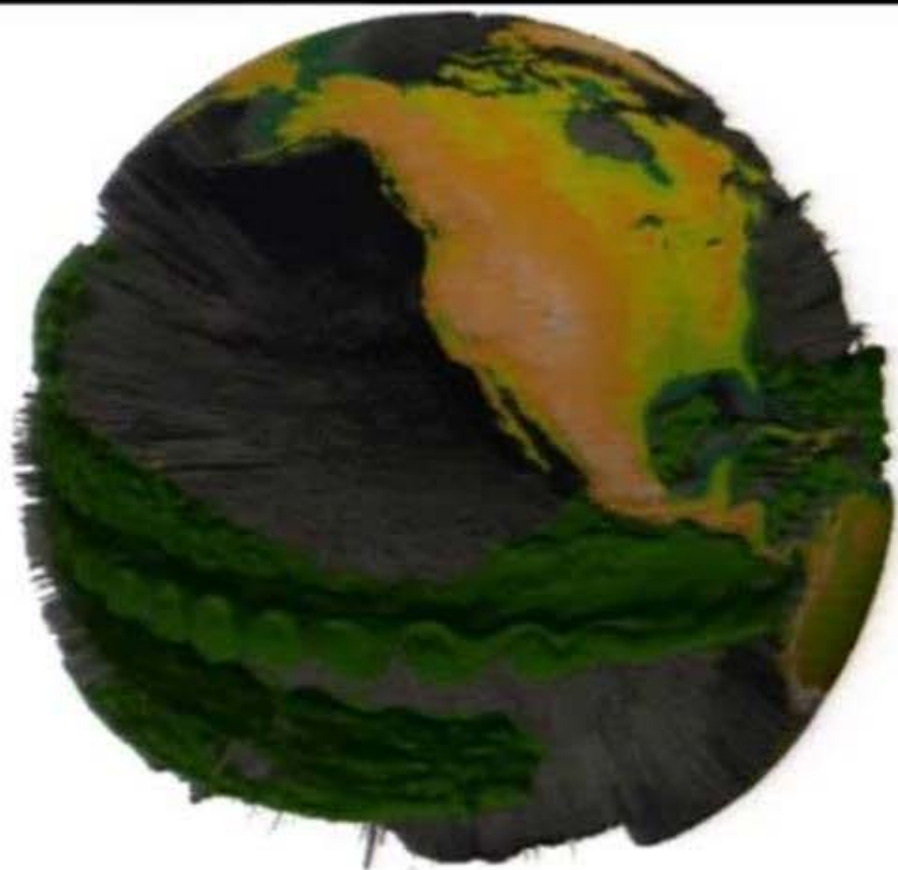
- t=15.0 temperature
- t=20.0 temperature
- t=25.0 temperature

Contour by salinity

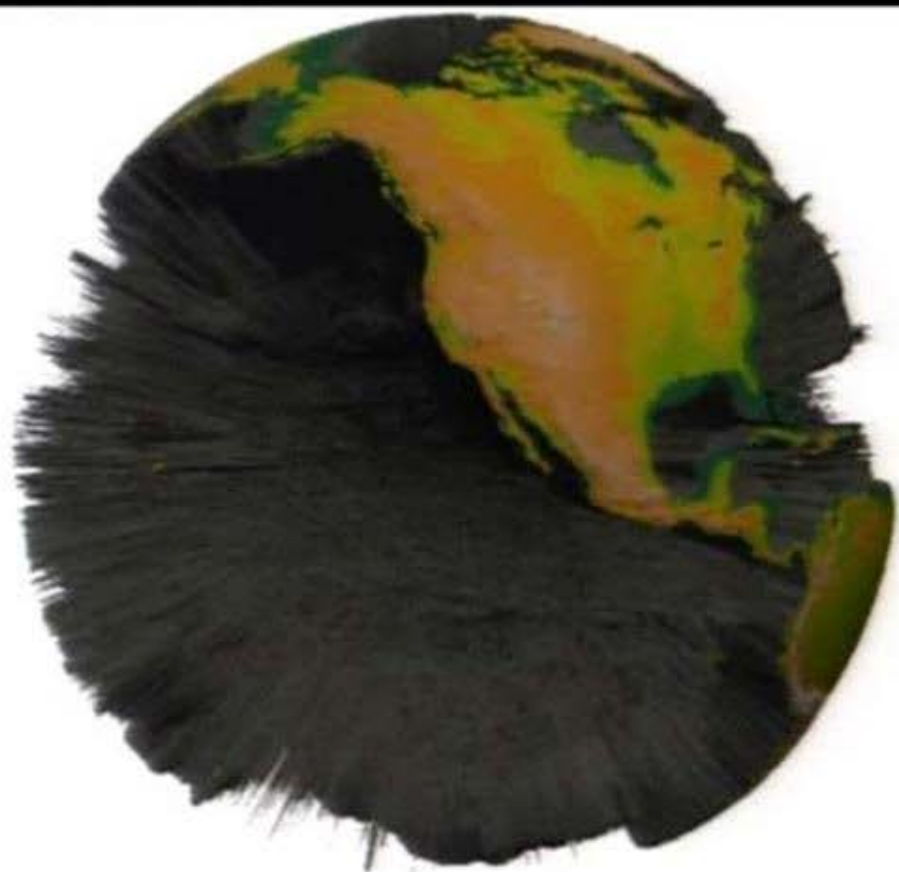
Time 8.0

Phi 300.0

Theta 115.0



<input checked="" type="checkbox"/>	Earth core					
<input checked="" type="checkbox"/>	Contour by temperature	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/>	Contour by salinity	<input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/>	Time	14.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Phi	300.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Theta	115.0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

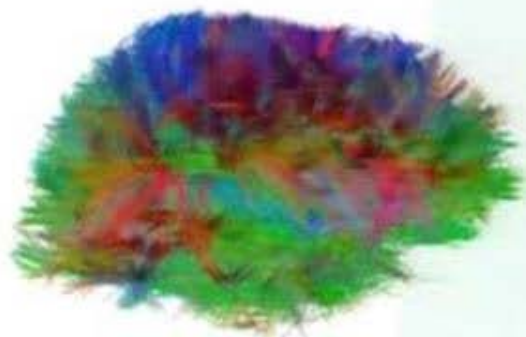


Contour by temperature ✓

- t=5.0
- t=10.0
- t=15.0
- t=20.0
- t=25.0



<input checked="" type="checkbox"/> Earth core		
<input checked="" type="checkbox"/> Contour by temperature		<input type="button" value="temperature :"/>
<input checked="" type="checkbox"/> t=10.0		<input type="button" value="temperature :"/>
<input checked="" type="checkbox"/> t=25.0		<input type="button" value="temperature :"/>
<input checked="" type="checkbox"/> Contour by salinity		<input type="button" value="salinity :"/>
<input checked="" type="checkbox"/> Time	1.0	<input type="button" value="⏪"/> <input type="button" value="⏩"/>
<input checked="" type="checkbox"/> Phi	300.0	<input type="button" value="⏪"/> <input type="button" value="⏩"/>
<input checked="" type="checkbox"/> Theta	115.0	<input type="button" value="⏪"/> <input type="button" value="⏩"/>



Questions?

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