WIFIRE/UCSD GIS Effort

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Fire is Part of the Natural Ecology
... but requires Monitoring, Prediction and Resilience

- Wildfires are critical for ecology, but volatile
- Fuel load is high due to fire suppression over the last century
- Changes in rainfall, wind, seasons, and thus wildfires, potentially induced by climate change
- Better prevention, prediction and maintenance of wildfires is needed

Disaster management of (ongoing) wildfires heavily relies on understanding their Direction and Rate of Spread (RoS).
What is lacking in disaster management today is...

a dynamic system integration of real-time sensor networks, satellite imagery, near-real time data management tools, wildfire simulation tools, and connectivity to emergency command centers.

.... before, during and after a firestorm.
A Scalable Data-Driven Monitoring, Dynamic Prediction and Resilience Cyberinfrastructure for Wildfires (WIFIRE)

Development of:

“cyberinfrastructure” for “analysis of large dimensional heterogeneous real-time sensed data” for fire resilience before, during and after a wildfire

WIFIRE is funded by NSF 1331615
WIFIRE: A Scalable Data-Driven Monitoring, Dynamic Prediction and Resilience Cyberinfrastructure for Wildfires

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The WIFIRE data-model federates data from multiple heterogeneous sources to providing detailed fire-related information.

monitoring

visualization

fire modeling

idi supported the currently operational florian server hosted at sdsc to enable programmable access to the data catalog.
Major success to bring internet to incident command in the field. Used in over 20 fires over time.

WIFIRE is funded by NSF 1331615
Terrain Visualization

Post-fire burn map
- SDG&E and HPWREN weather data

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Geospatial Workflows for Fire Modeling

Kepler is an open source environment for combining and automating Cyberinfrastructure components

– Read real-time and archived weather station measurements
– GIS components to pre- and post-process data
– Execute fire models and signal processing steps
– Parallel execution
– Provenance for execution history

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www.kepler-project.org
Workflow Outputs

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Creating a Virtual UCSD with Disparate Data
To summarize:
Effective systems for real-time acquisition and analysis of wildfire big data can make a huge impact on wildfire resilience.

WIFIRE is on the web!
• Website: http://wifire.ucsd.edu
• Twitter: @WIFIREProject