PAIRS: An Organized Big Physical Data Service to Accelerate Discovery and Analytics

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Physical Analytics Integrated Repository and Services (PAIRS): Bridging Geospatial Datasets and Discovery

PAIRS Data Repository

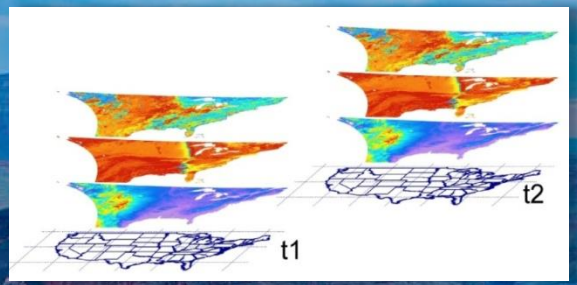
Data Source

Massive but "Organized" Data Store

- Global coverage with petabytes of data.
- Data aligned on a set of common grids.
- Spatially & temporally indexed for query performance.

Data-as-a-Service

Multi-data layer query and analytics



Incompatible
- Resolutions (spatial temporal)
- Formats (xml, json, raster, vector)
- Reference systems, Projections

Barrier to querying and joining

	Complex Query Example
	All locations with soil type A in Iowa
and	Crop type B
and	Yields larger than y1 tons/acres
and	Air temperatures > T1 @ t1
or	Yearly average air temperatures larger than Tavg1

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Summary of Technology

Focus Areas

Gallo vineyard

• Agr

Deforestation ne

l use

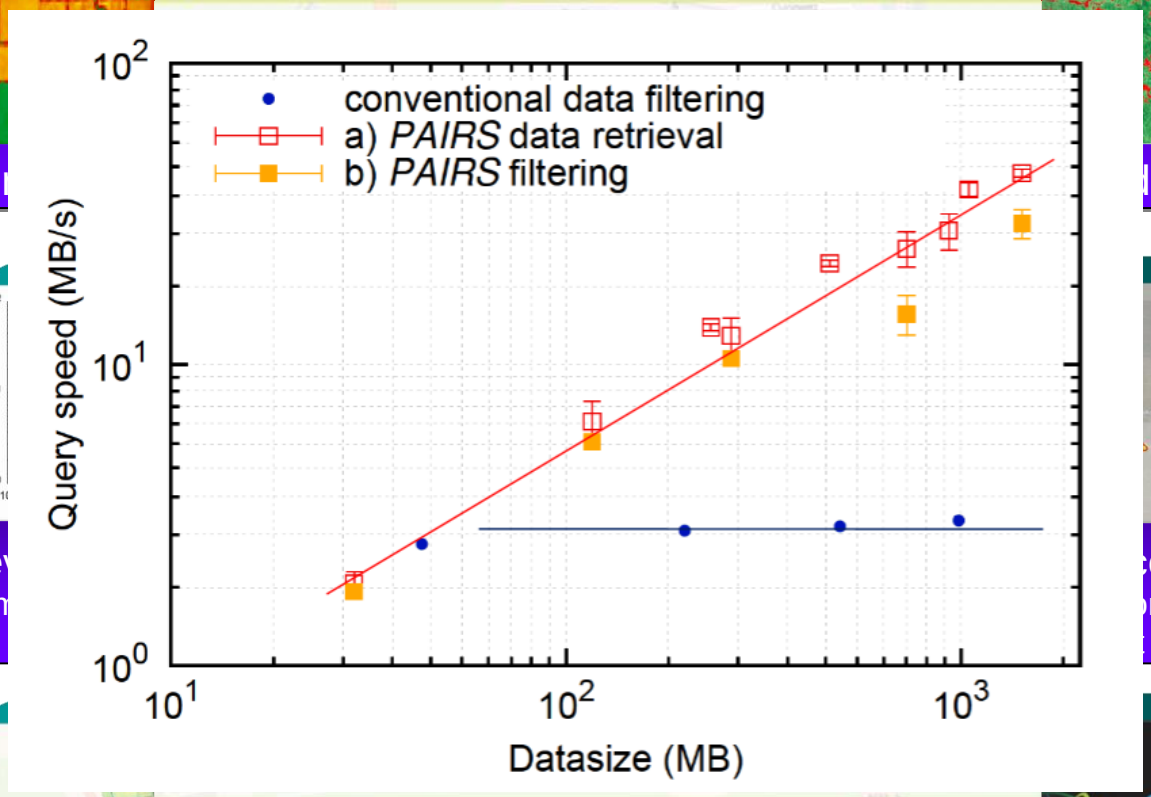
Unique Capabilities

Data retrieval speed

•Rapid retriev
- Retrieval tim
size.

Satellite recognized shale sites

cognition
m multiple sources.
learning.



Core Technologies

Drone & satellite overlay

• Scalable Big Data-as-a-Service for PRE-ALIGNED & indexed datasets

• Physical models
- Radiative transfer, crop models,

• Deep machine learning

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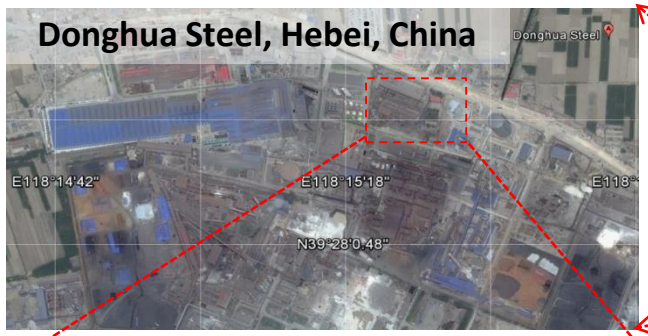
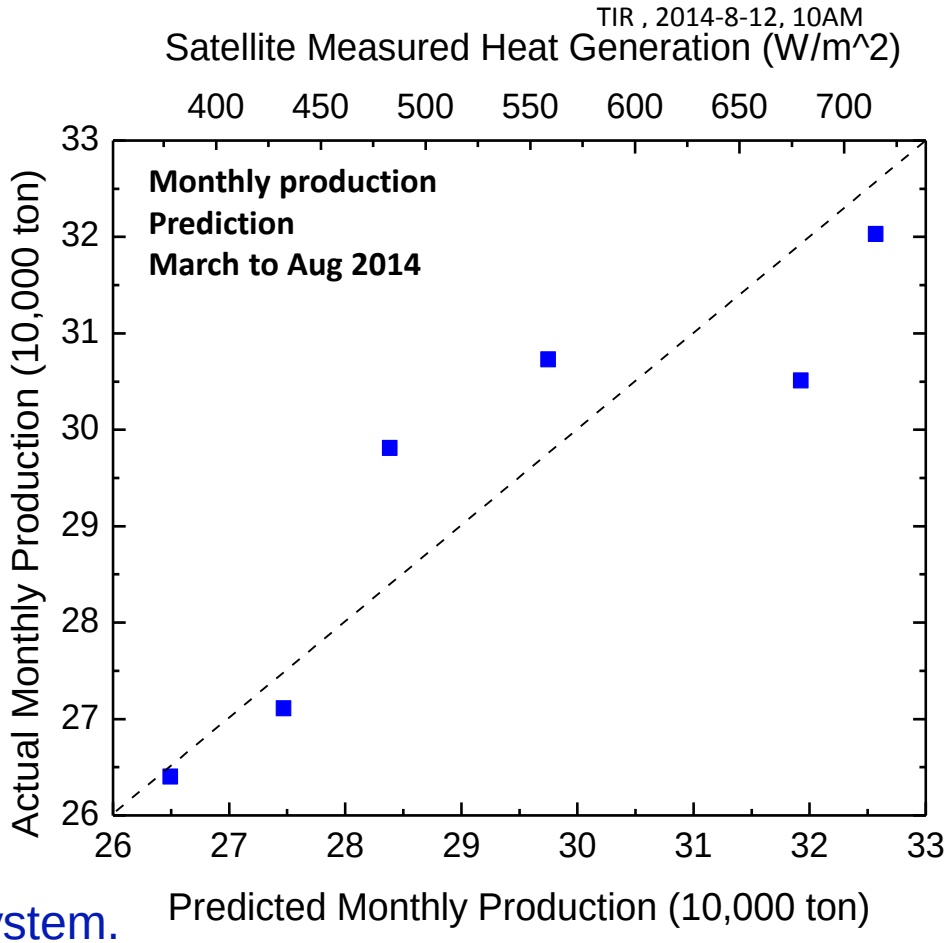
Example: Reporting Industrial Activity Ahead of Census

- Remote sensing provided accurate estimates of monthly productions.
- Preliminary validation using after-the-fact published data.



Blast Furnace Location



Joining force with

- Geospatial / economic data providers.
- Users/value amplifiers of the PAIRS system.
- Other forecasters.

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- Video demos:
  http://pairs.mmthub.com/manual/videos/PAIRS_Orange_Florida.Webm
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