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# A Semantically Enabled Fire Monitoring Application

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**Semantic Web Challenge**  
**International Semantic Web Conference (2012)**

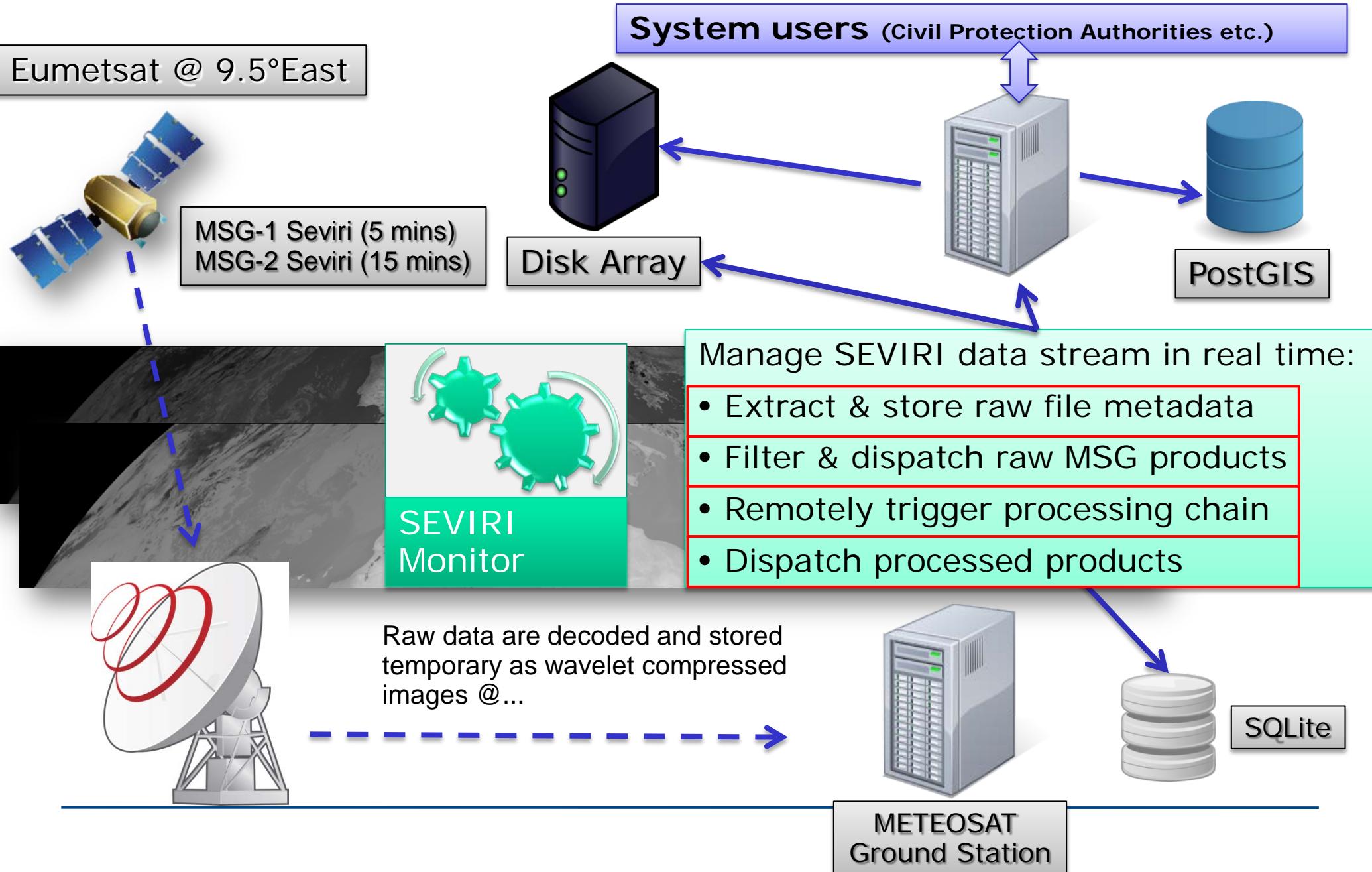
# Outline

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- The Fire Monitoring Service of the National Observatory of Athens (NOA)  
[http://papos.space.noa.gr/fend\\_static](http://papos.space.noa.gr/fend_static)
  - Improving the service using semantic technologies
    - Representing fire related information using ontologies
    - Enriching products with linked geospatial data
    - Refining products
  - Evaluation
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# Fire monitoring application

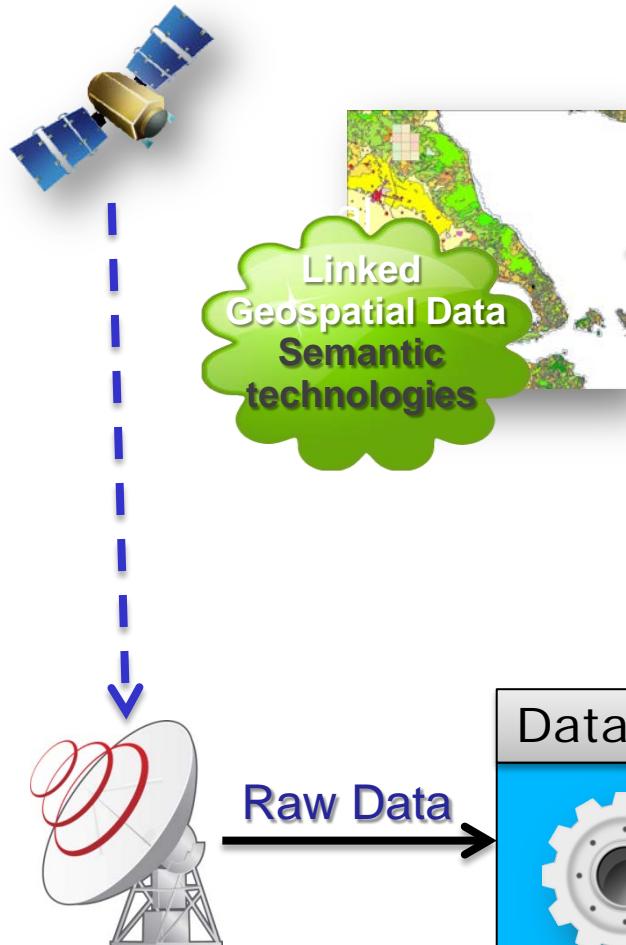
Pre-TELEIOS practice



# Fire monitoring application

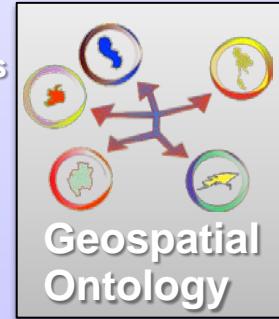
Advancements – integration of the TELEIOS technologies

Eumetsat @ 9.5°East



Back End: MonetDB / Strabon

- Corine Landcover
- Admin Boundaries
- POIs

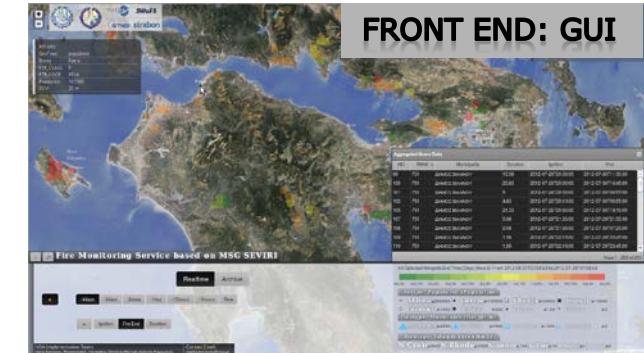


Strabon



HotSpots

Processing Chain  
(SciQL based)



- Search & Display
- Search for raw & Processing
- Real-time Fire Monitoring
- Refinement (Post-Processing)
- Linked Data

# Linked Geospatial Data

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- Datasets that we developed and published as linked data:
  - Corine Land Use / Land Cover
  - Coastline of Greece
  - Greek Administrative Geography
- Portal: <http://www.linkedopendata.gr/>
- Datasets from Linked Open Data Cloud
  - LinkedGeoData
  - GeoNames

# Semantic Enrichment for Hotspots

- **Enrich hotspot products**

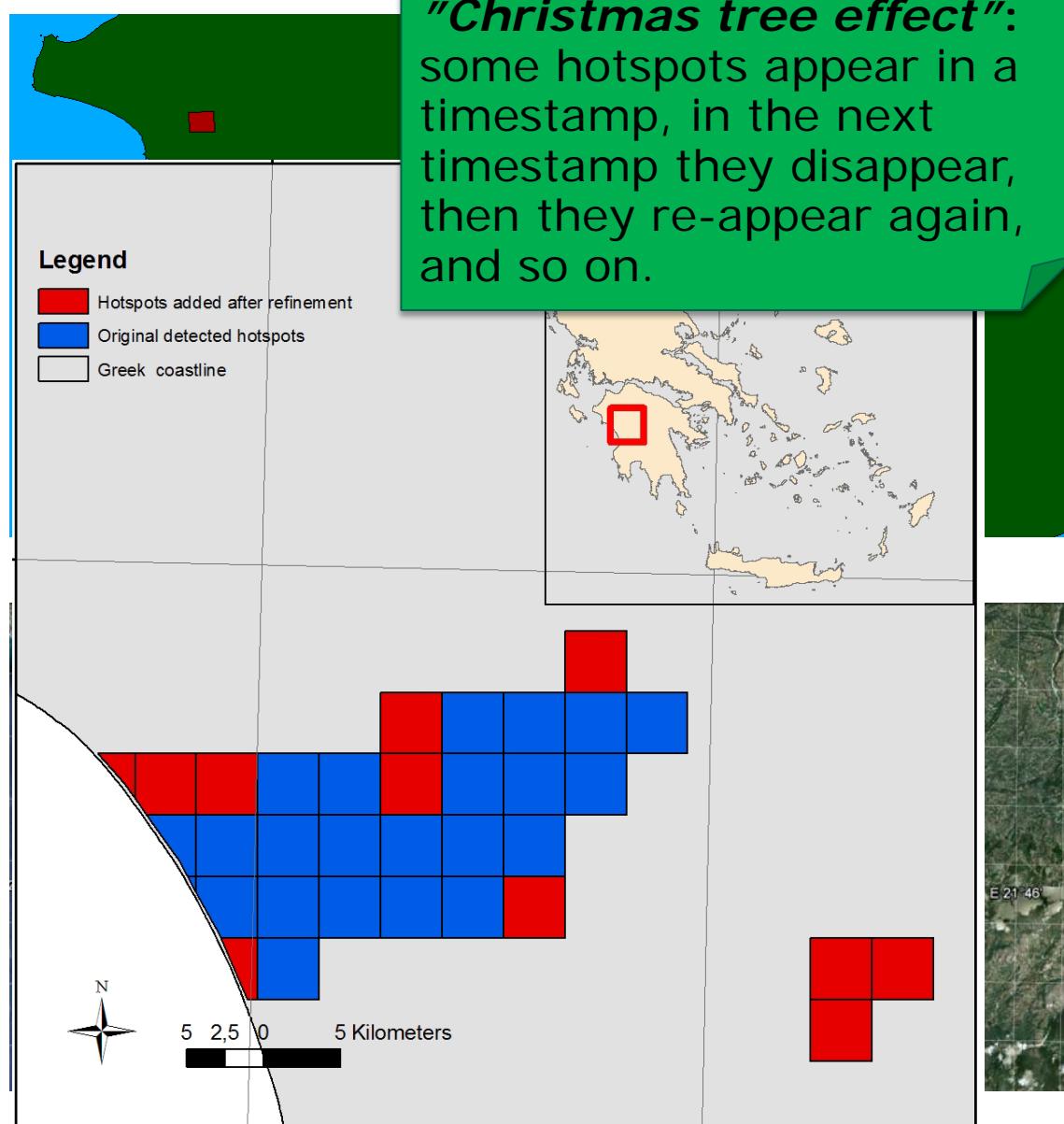
1. Connect each hotspot with a municipality that it is located

- **Improve accuracy with respect to **underlying area****

2. Eliminate false alarms in sea
3. Eliminate false alarms in inconsistent land cover areas
4. Keep land part of the polygon

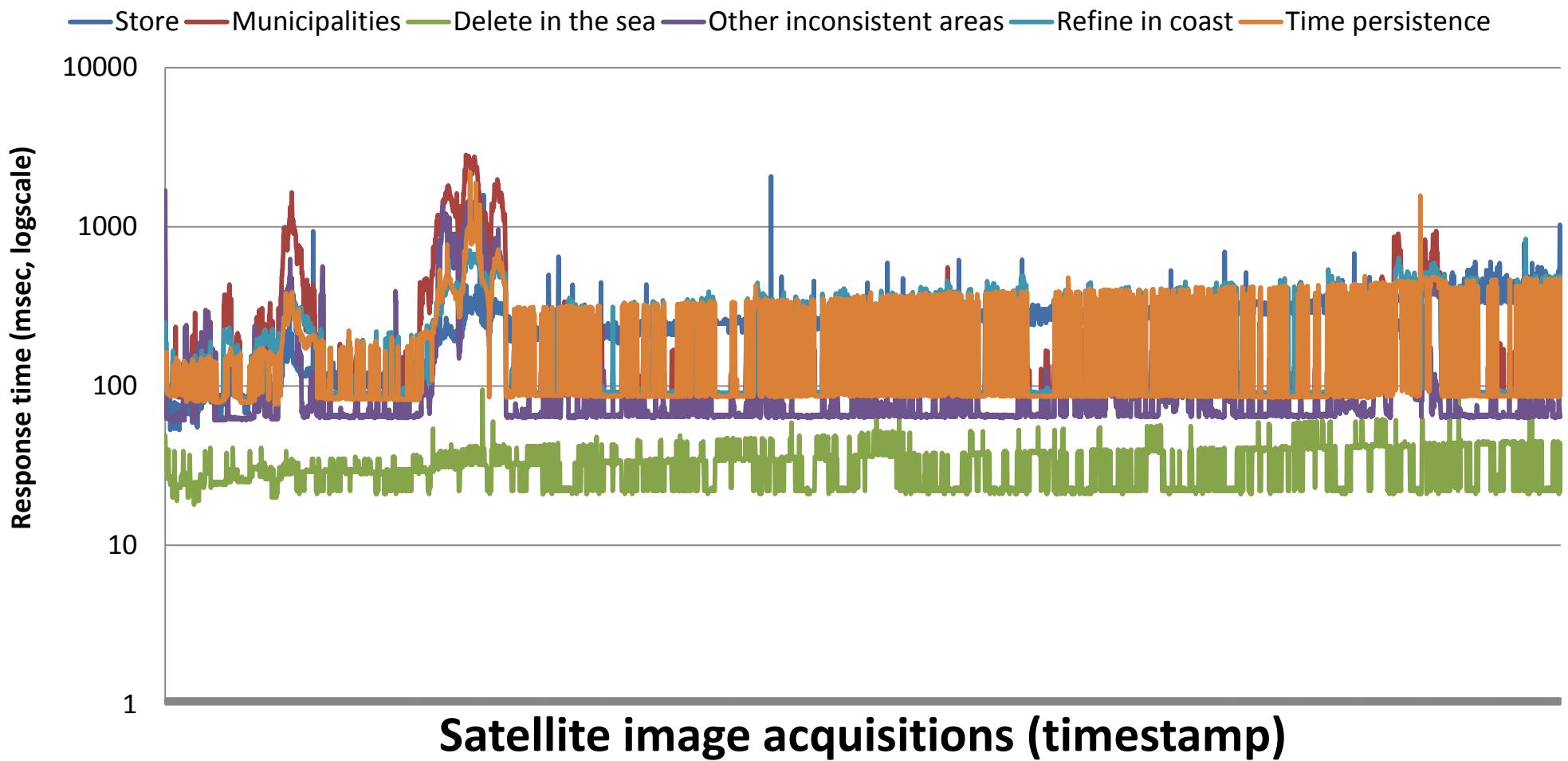
- **Improve accuracy with respect to **temporal persistence** of each hotspots**

5. Remove “Christmas tree” effects



# Evaluation of performance

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# Why is it important?

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- **Fully automatic** while the previous service had many manual steps
- **Excellent performance**
- **Fully operational** and on the Web
- Used on a **daily basis** during and after the events in the **summer of 2012** by
  - Greek Civil Protection Agency
  - Greek Fire Brigade
  - Greek Army
- Initial user comments very encouraging

# Why has it been a challenge?

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- We developed a new **geospatial RDF store (Strabon)**
- We developed a new **query language for linked geospatial data (stSPARQL)**
- We published **new linked geospatial datasets** (some of the very few available ones with **complex geometries**)
- The stSPARQL update statements are very complex (many triple patterns, many SPARQL constructs)

**Thank you for your attention!**

# Any questions?

- Strabon

- Manolis Koubarakis, Kostis Kyzirakos, Manos Karpathiotakis, Charalampos Nikolaou, Giorgos Garbis, Konstantina Bereta, Kallirroi Dogani , Stella Giannakopoulou and Panayiotis Smeros.
  - Web site: <http://strabon.di.uoa.gr>
  - Mercurial repository: <http://hg.strabon.di.uoa.gr>
  - Trac: <http://bug.strabon.di.uoa.gr>
  - Mailing list: <http://cgi.di.uoa.gr/~mailman/listinfo/strabon-users>

- Real Time Fire Monitoring Service

- [http://papos.space.noa.gr/fend\\_static](http://papos.space.noa.gr/fend_static)

- Greek Linked Open Data

- <http://www.linkedopendata.gr>

- TELEIOS EU Project

- <http://www.earthobservatory.eu>



# [ISWC 2012 research paper, today at 16:00]

