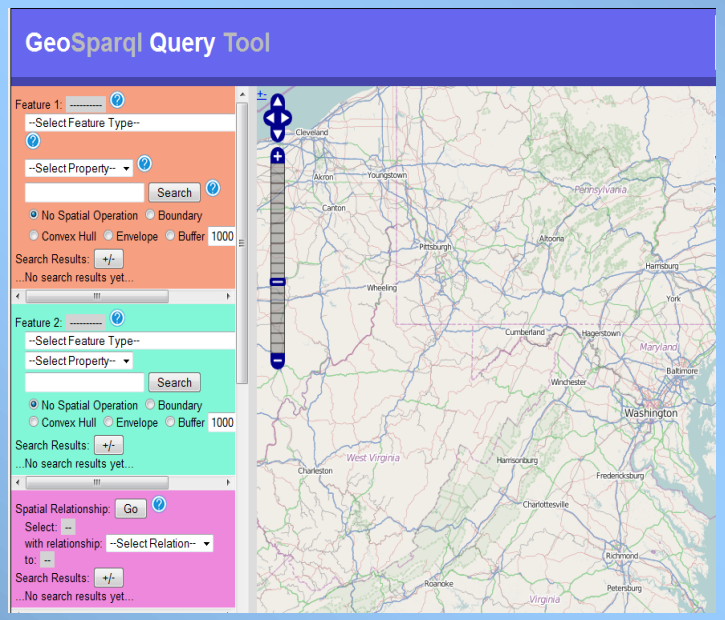

GeoQuery Tool to Pose Spatial Queries over the Web

http://geoquery.cs.jmu.edu/geoquery/

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Geospatial Semantics June 2014

Querying Linked Data (RDF)

Information is Stored as Triples

Subject	(Karmy's Airport)
Predicate	is a type of
Object	airport

Subject	(Karmy's Airport)
Predicate	has label
Object	"Karmy's Airport"
	etc.

RDF is queried using the W3C query language called SPARQL. GeoSPARQL adds spatial operators.

Uniform Resource Identifiers (URIs)

Subject	http://cegis.usgs.gov/rdf/gnis/Features/1498860
Predicate	http://www.w3.org/1999/02/22-rdf-syntax-ns#type
Object	http://cegis.usgs.gov/rdf/trans/airportPoint

Subject	http://cegis.usgs.gov/rdf/gnis/Features/1498860
Predicate	http://www.w3.org/2000/01/rdf-schema#label
Object	“Karmy’s Airport”
	etc.

GeoSPARQL

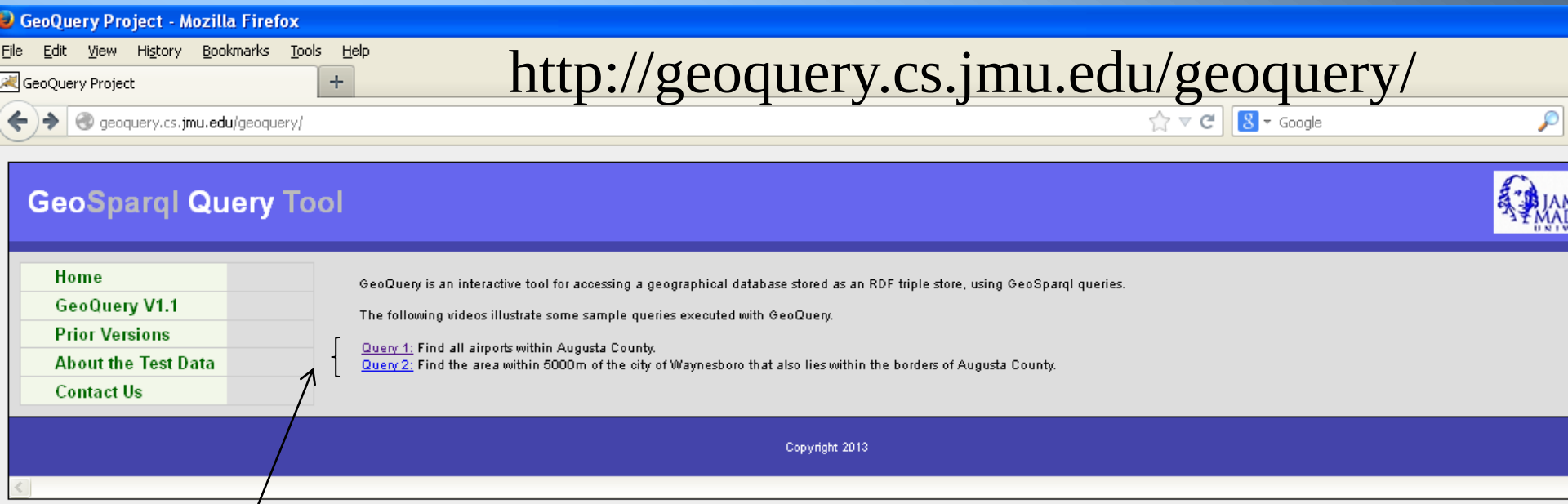
- Query language for geospatial RDF systems
- Specification approved by Open Geospatial Consortium (OGC) Technical Committee

```
SELECT ?m                    (? Denotes a variable)
WHERE {
    ?p   a   ex:Park;
         geo:hasGeometry ?pgeo .
    ?m   a   ex:Monument;
         geo:hasGeometry ?mgeo .
    ?mgeo geo:sfWithin ?pgeo .
}
```

GeoSPARQL queries allow spatial processing and indexing over Semantic Web datasets (Dave Kolas)

Find all Monuments within Parks.

Developed by Professor Ralph Grove at James Madison University with funds from our NSF INTEROP Grant (idea from Professor James Wilson, JMU)



http://geoquery.cs.jmu.edu/geoquery/

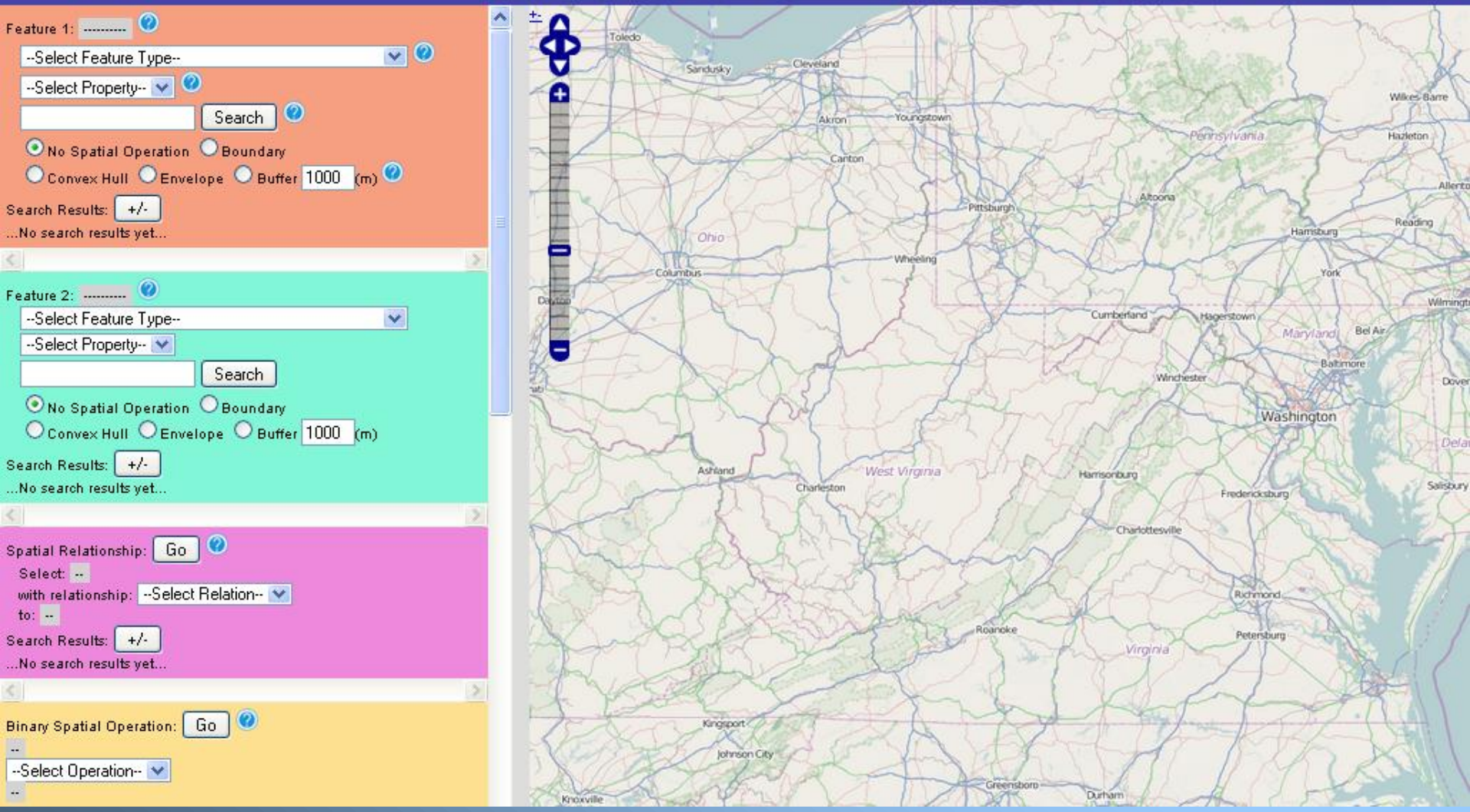
Videos

Tool for posing GeoSPARQL queries
Can perform spatial operations over the Web

Uses Parliament's implementation of GeoSPARQL (triple store)

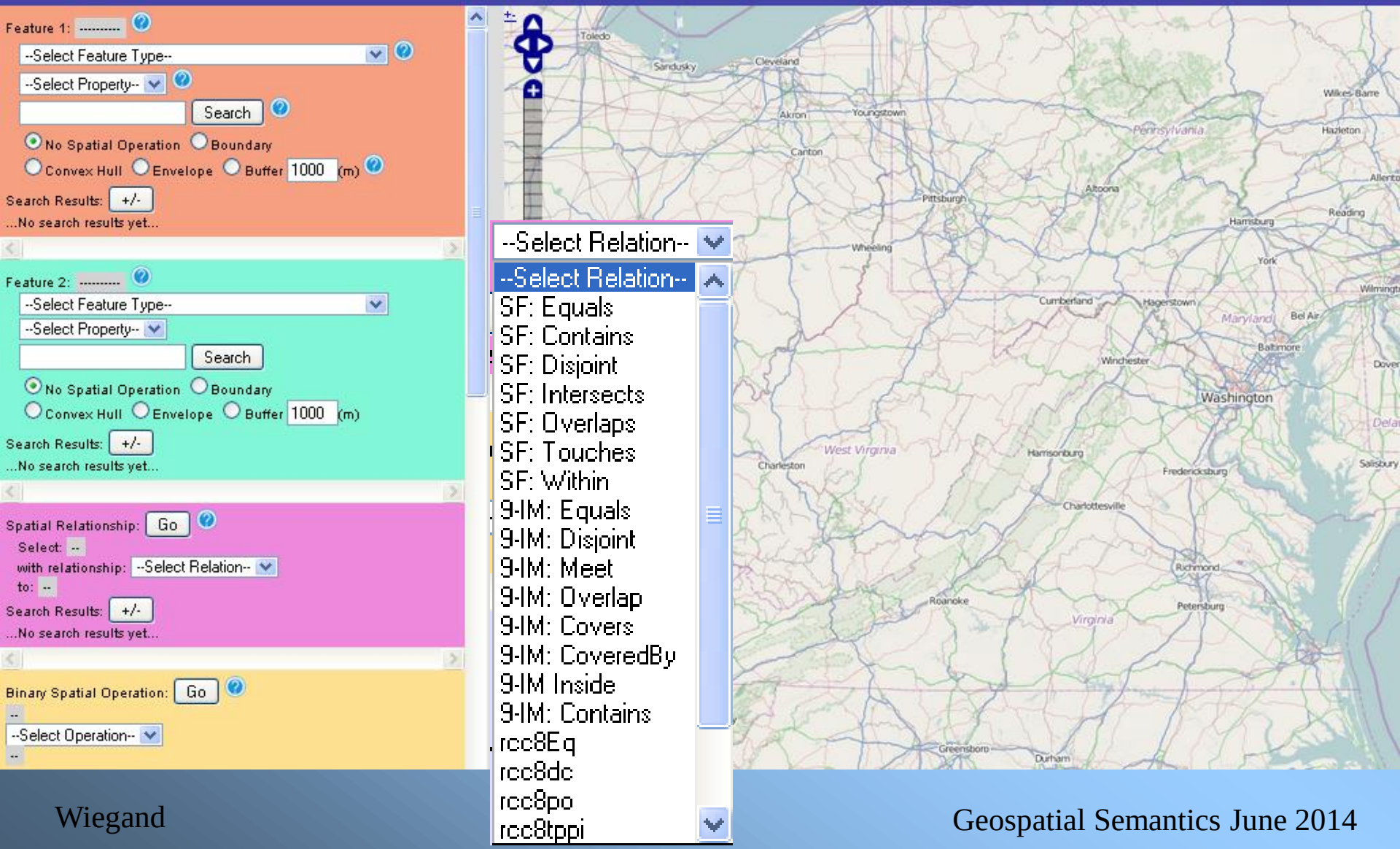
GeoSparql Query Tool

http://geoquery.cs.jmu.edu/geoquery/



Spatial Relationships

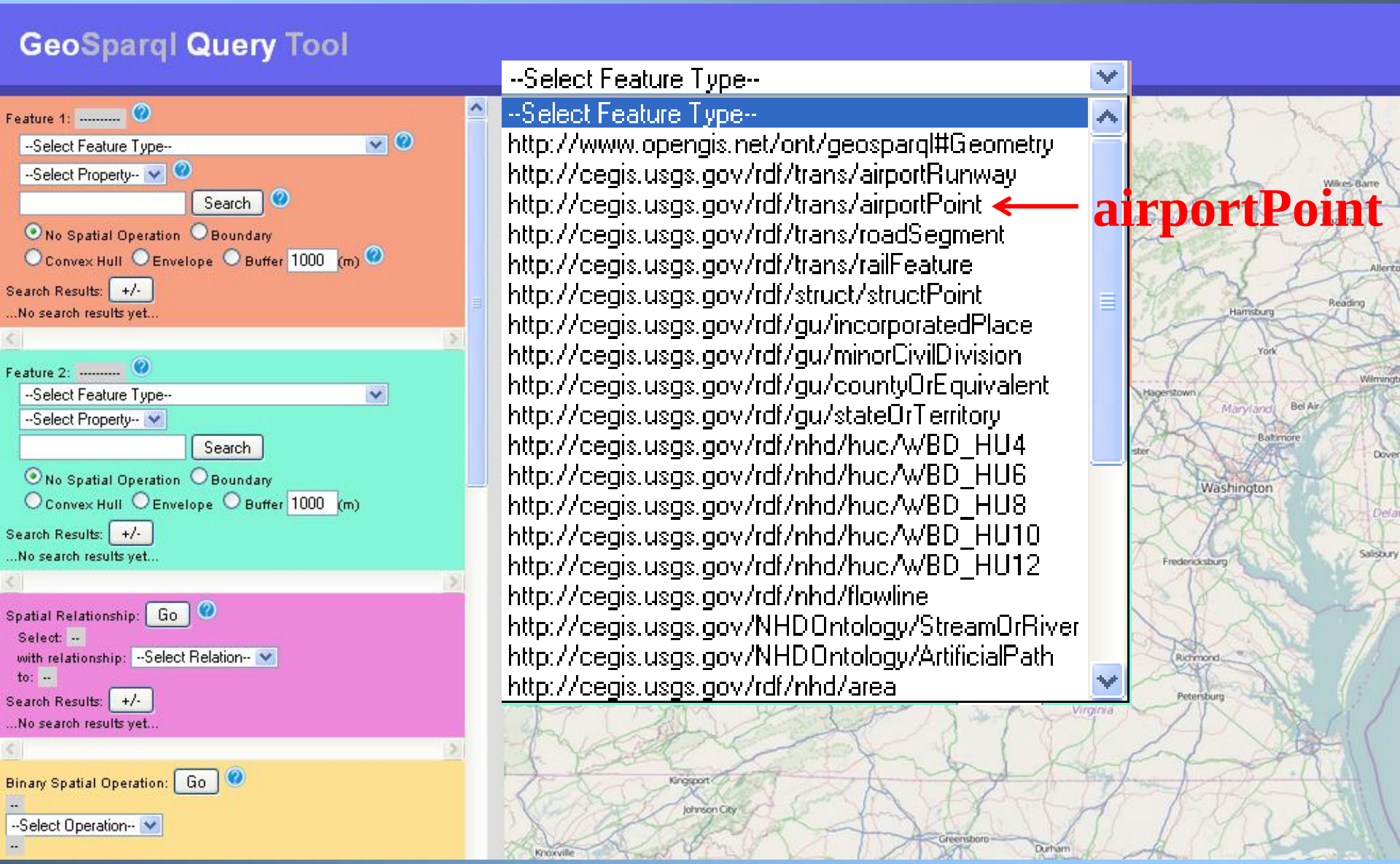
GeoSparql Query Tool **http://geoquery.cs.jmu.edu/geoquery/**



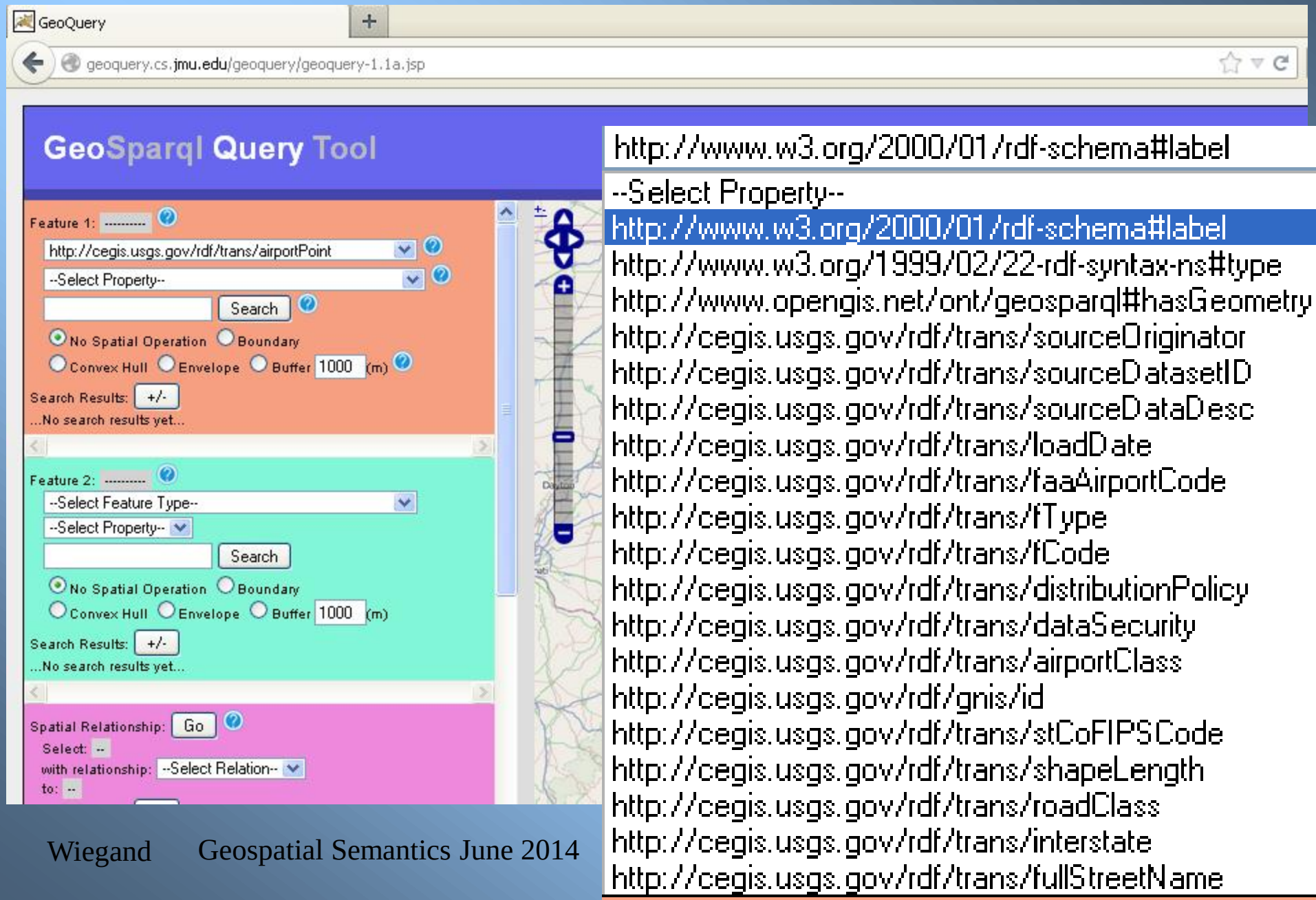
A query with one feature

Find all airports

Select Feature Type



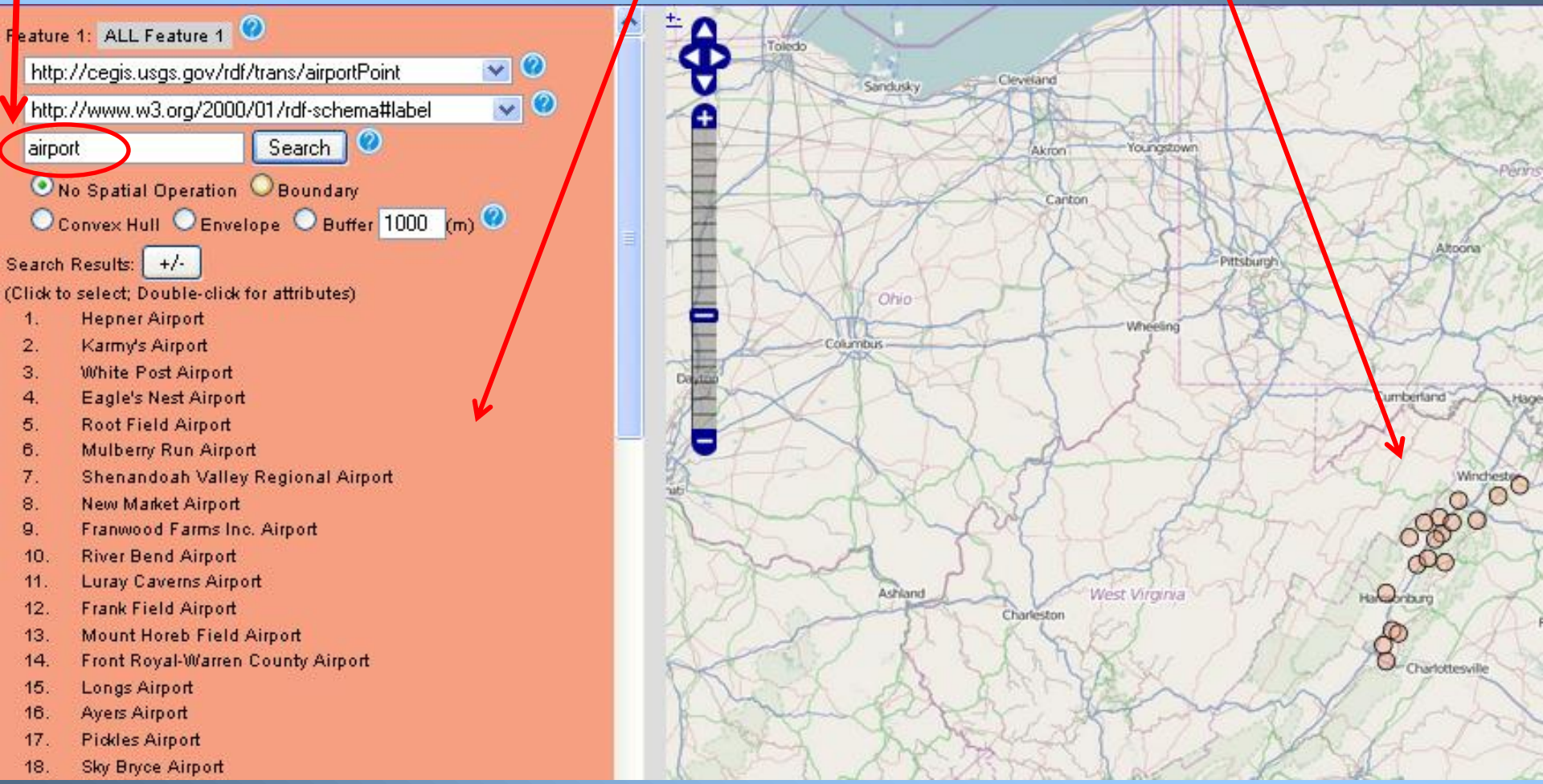
Select Property for airportPoint



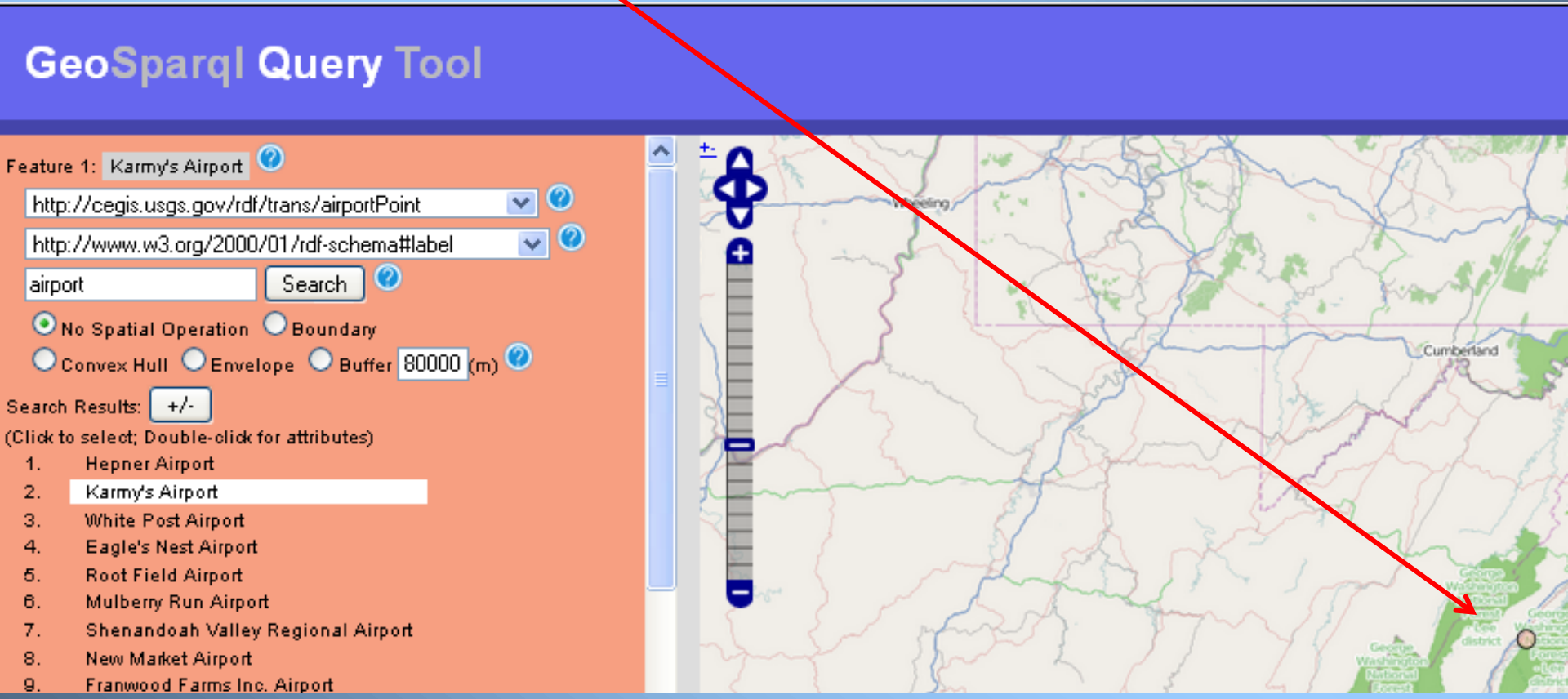
Type in ‘airport’

List of airports

Spatial results



Click on Karmy's Airport to select it, Choose Buffer, See result



A query with two features

Find the county Karmy's Airport is in

Find the county Karmy's Airport is in

Feature 1: ALL Feature 1

http://cegis.usgs.gov/rdf/gu/countyOrEquivalent

http://www.w3.org/2000/01/rdf-schema#label

Search

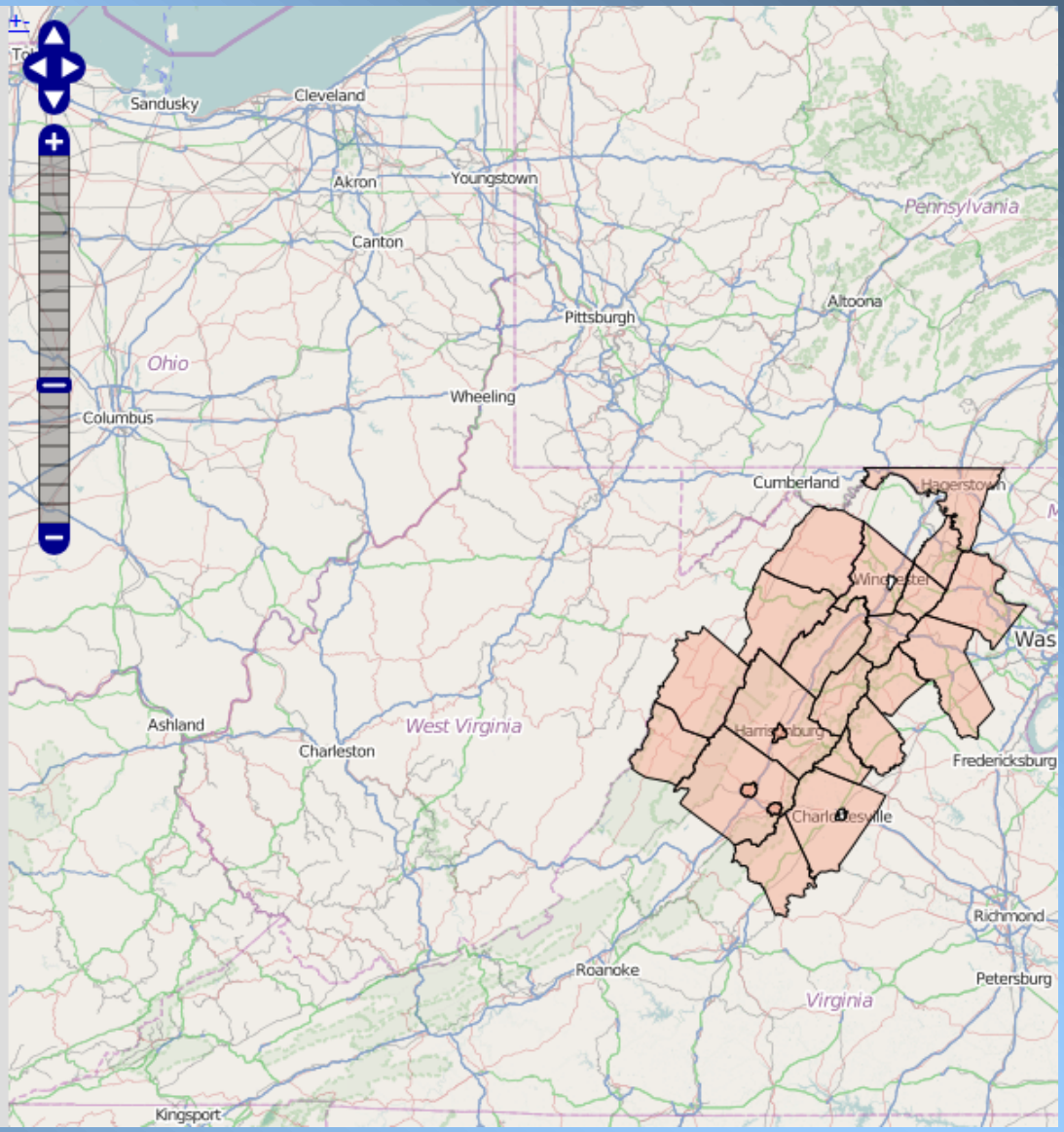
No Spatial Operation Boundary

Convex Hull Envelope Buffer 1000 (m)

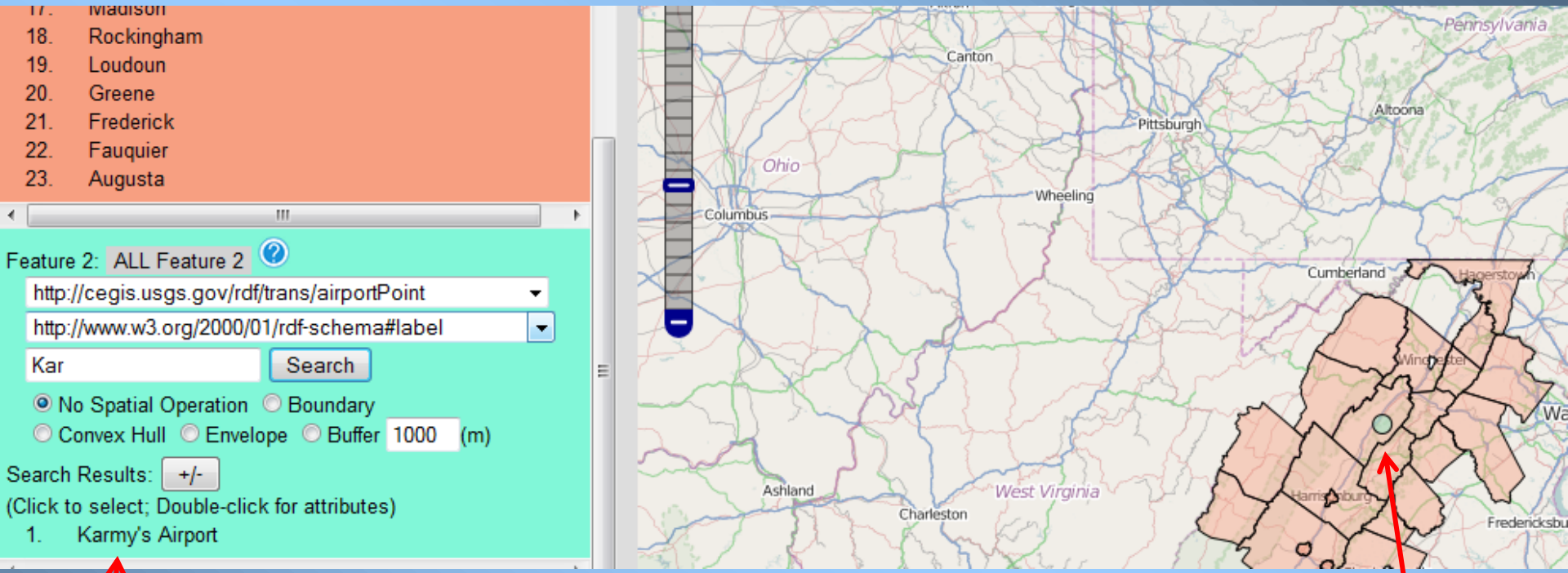
Search Results: +/-

(Click to select; Double-click for attributes)

1. Staunton
2. Hampshire
3. Hardy
4. Washington
5. Clarke
6. Albemarle
7. Warren
8. Rappahannock
9. Shenandoah
10. Highland
11. Pendleton
12. Jefferson
13. Nelson
14. Page
15. Harrisonburg
16. Waynesboro
17. Madison
18. Rockingham
19. Loudoun
20. Greene
21. Frederick
22. Fauquier
23. Augusta

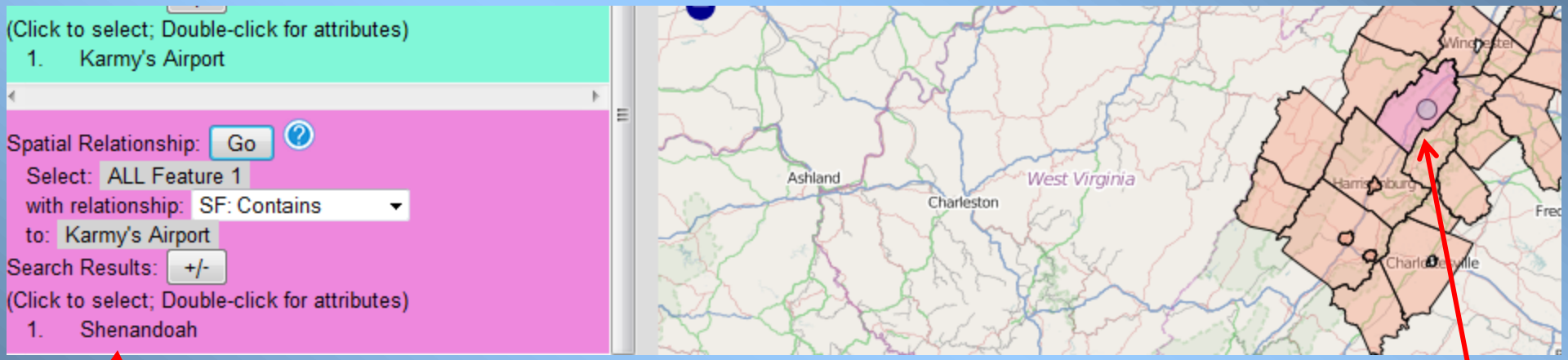


For Feature 2, Find Karmy's Airport



Typing just 'Kar' in the text box finds Karmy's Airport

Choose SF:Contains to get county containing Karmy's Airport



Shenandoah is listed and
turns a different color on the map

GeoSPARQL Query

Find the county name for Karmy's airport:

(? Denotes a variable)

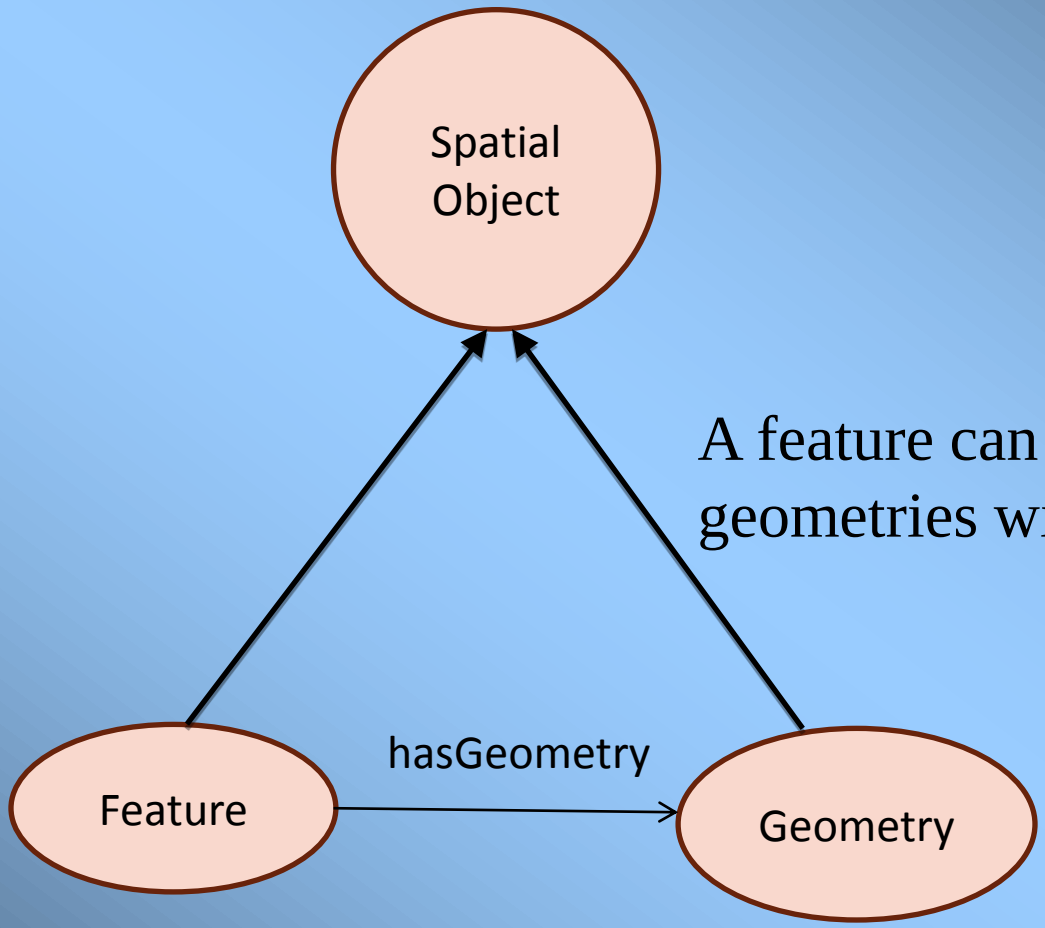
```
SELECT  ?countyName
WHERE   {
    ?county   rdf:type       cegis:countyOrEquivalent  .
    ?county   rdfs:label     ?countyName   .
    ?county   geo:hasGeometry    ?countyGeometry  .
    ?countyGeometry    geo:asWKT   ?countyWKT  .

    ?airport   rdf:type     cegis:airportPoint .
    ?airport   rdfs:label   "Karmy's Airport"   .
    ?airport  hasGeometry     ?airportGeometry   .
    ?airportGeometry    geo:asWKT   ?airportWKT   .

    FILTER (geof:sfContains(?countyWKT, ?airportWKT))   .
}
```

From the GeoSPARQL User Guide

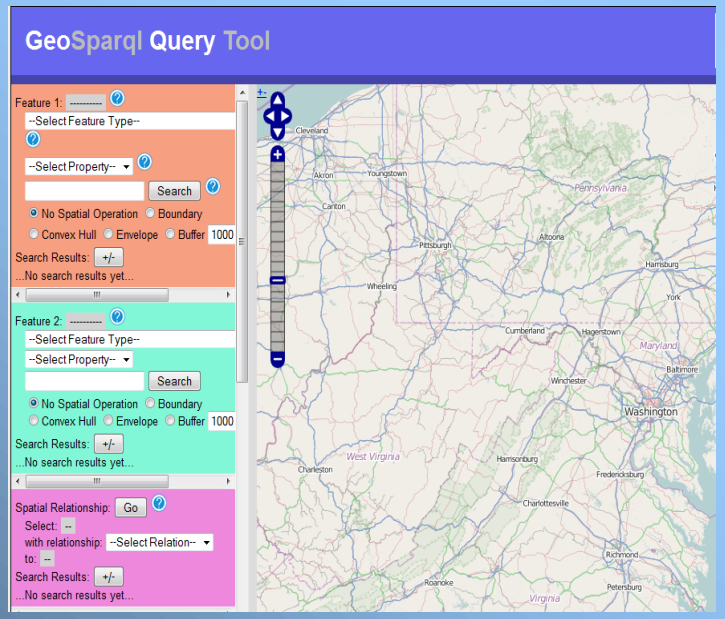
Dave Kolas and Robert Battle



A feature can have multiple geometries with this model.

Summary: GeoQuery Tool

- Allows easy querying over the Web for spatial data in RDF format because SPARQL/GeoSPARQL syntax is avoided



Geospatial Semantic Web

Land Use Code Demo

http://www.ssec.wisc.edu/landuse/main

With much appreciation to Tommy Jasmin (SSEC)!

(who helped REU students Alec Anderson and Coda Phillips)

Landuse Demo

WISCONSIN SSEC

Home Products

Residential Code

Areas

- [ ] All
- [ ] Bay Lakes RPC
- [ ] Dane County
- [ ] Eau Claire County
- [ ] ECWRPC
- [ ] Madison(city)
- [ ] NCWRPC
- [ ] SEWRPC

Run Query

Residential Code

Group Quarters

Areas

- [ ] All
- [x] Bay Lakes RPC
- [x] Dane County
- [x] Eau Claire County
- [x] ECWRPC
- [x] Madison(city)
- [x] NCWRPC
- [x] SEWRPC

Run Query

Results

Bay Lakes RPC [170]: Group Quarters
Dane County [129]: Group Quarters
Eau Claire County [R]: Residential, superclass of Group Quarters
ECWRPC [942]: Group Quarters
Madison(city) [12]: Group Quarters
NCWRPC [5]: Residential, superclass of Group Quarters
SEWRPC [662]: Regional Group Quarters, subclass of Group Quarters
SEWRPC [661]: Local Group Quarters, subclass of Group Quarters

Thank you!

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