

Discovering Spatial Data for Our Changing Earth

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Tucson, Arizona

Sara Lafia, PhD student
University of California, Santa Barbara

spatial@ucsb
CENTER FOR SPATIAL STUDIES



Search, and research, have evolved dramatically over the past decades.

ALEXANDRIA
DIGITAL
LIBRARY

CDL CALIFORNIA
DIGITAL
LIBRARY

[ADL HOME](#) • [CDL HOME](#) • [HELP](#)

**QUICK PLACENAME
SEARCH**

Search the entire world
for...

Enter "Rome" if you want Rome, Italy.
[More information](#)

GENERAL SEARCH

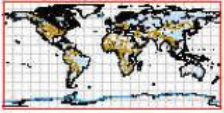
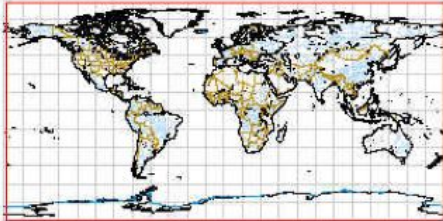
**1. Select collection to
search**

[Browse collections](#)

2. Set geographic region

Use the map to the right to set the

Map Browser



Click map to:

Change location to:

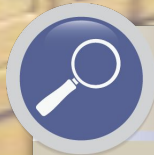
Navigation controls: Zoom Out, Zoom In, Reset, Shape, and directional arrows.

3. **Jemez River**
Type: rivers. ADL identifier: adl_gazetteer:6675084.
[HIGHLIGHT IN MAP](#) • [COMPLETE DESCRIPTION](#)

4. **San Diego River**
Type: rivers. ADL identifier: adl_gazetteer:6647659.
[HIGHLIGHT IN MAP](#) • [COMPLETE DESCRIPTION](#)

5. **San Diego-La Jolla Underwater Park**
Type: parks. ADL identifier: adl_gazetteer:6645054.

Physical search spaces, like card catalogs or library shelves, create neighborhoods.



SEARCH

LIBRARY CATALOG

[Go Back](#) [Help](#) [Permalink](#) [Logout](#)

Quick Search

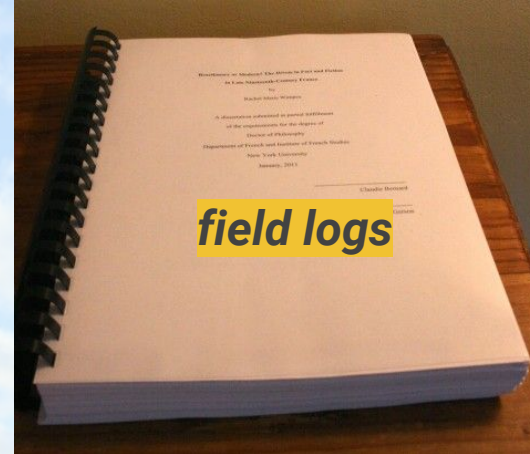
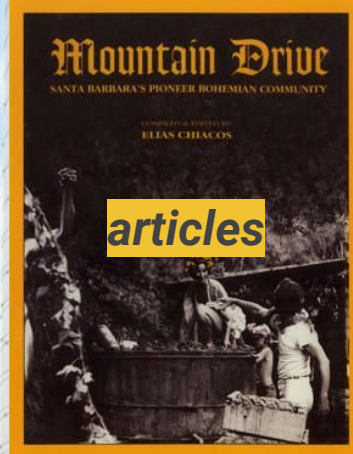
Catalog ☒ **Keyword** ☐ Browse ☐ Google

Search for

☒ **general** ☐ author ☐ title ☐ subject ☐ series ☐ periodical title

[Power Search](#)

Academic research tends to be **siloed**, posing discovery challenges.



	A	B	C
1	probeset	ITCC0600	ITCC0
2	1007_s_at	430.8	2
3	1053_at	79.5	9
4	117_at	65.9	:
5	121_at	203.3	:
6	1255_g_at	5	1
7	1294_at	114.6	:
8	1316_a	:	9
9	1320_a	:	:
10	1405_i_at	313.8	1
11	1431_at	18.8	:
12	1438_at	2.4	:
13	1487_at	94	8
14	1494_f_at	30	:
15	1552256_a_at	33.4	:
16	1552257_a_at	109.2	:
17	1552258_at	31.2	:

How can we better **integrate** institutional data to make it **discoverable**?



UCSB Open Data

Access open data about UCSB. Find content related to your thematic or spatial areas of interest.



Explore Open Data Groups



MesoAmerican Research Center



Interdisciplinary Research
Collaboratory



Interactive Campus Map



Cheadle Center for Biodiversity

Dr. Katja Seltmann



"insect counts"

Dr. Anabel Ford



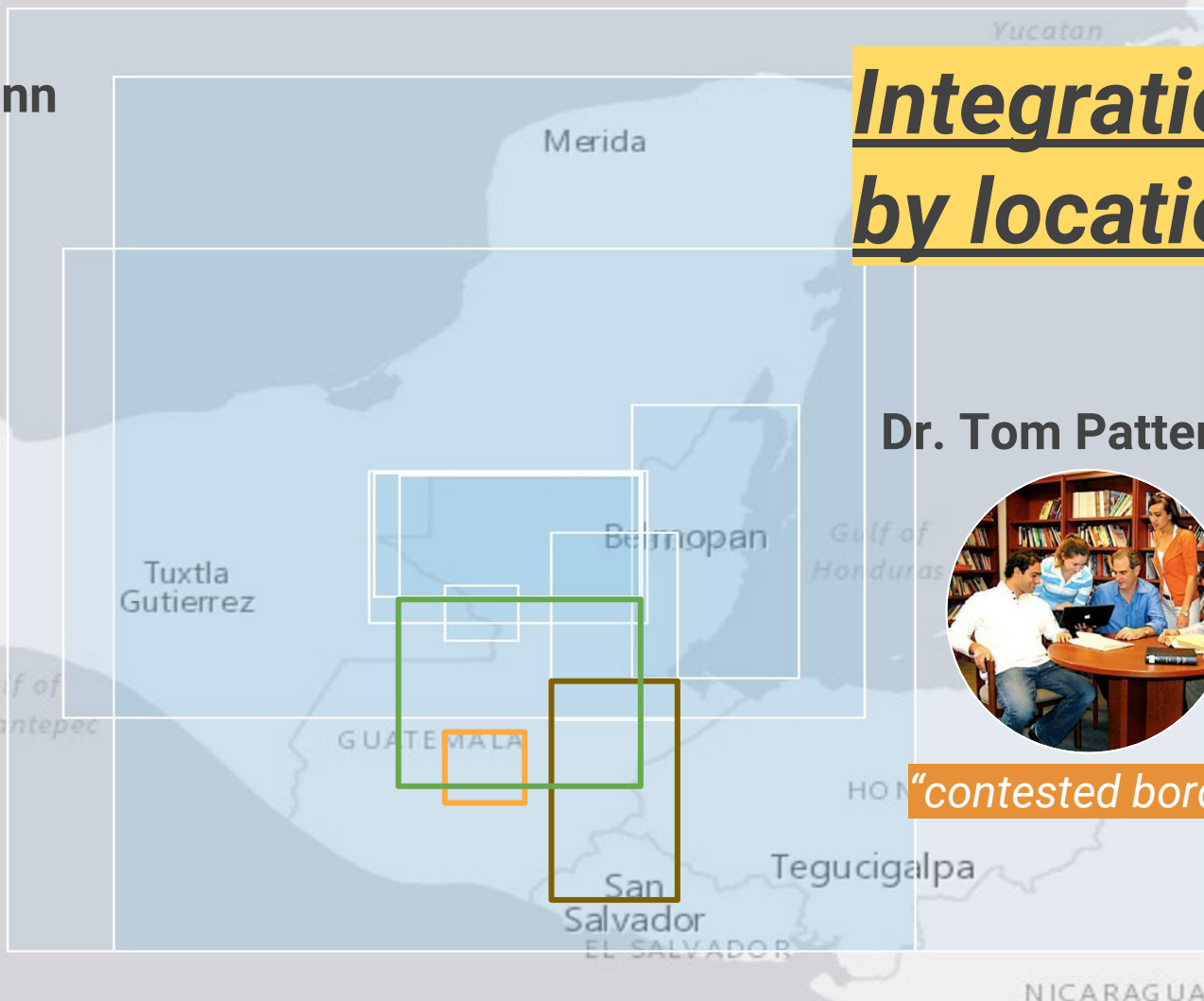
"excavation sites"

Integration by location

Dr. Tom Patterson



"contested borders"

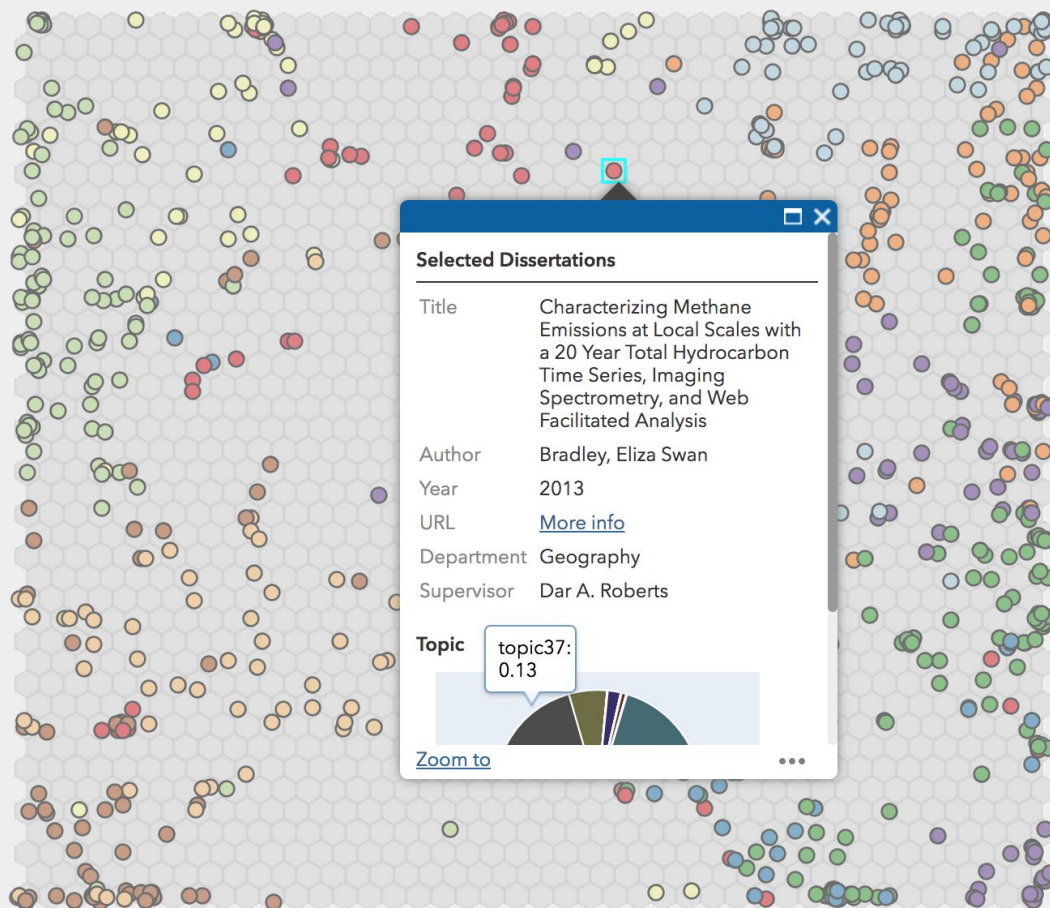


Legend

Selected Theses and Dissertations

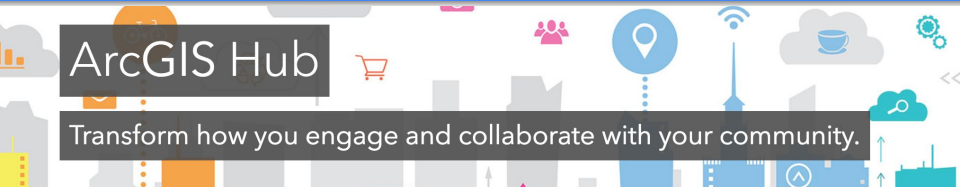
- Chemistry
- Computer Science
- Education
- Electrical and Computer Engineering
- Geography
- History
- Materials
- Physics
- Psychology
- Sociology

***Integration
by theme***



How can we **improve** search for institutional data to make it more broadly **accessible**?

Search for data using **colloquial** user terms must be supported **semantically**.



Browse by Categories



Safe

Crime
Disaster
Emergency Response



Sustainable

Climate
Energy
Infrastructure



Liveable

Culture
Housing
Transportation



Prosperous

Demographics
Economy
Education



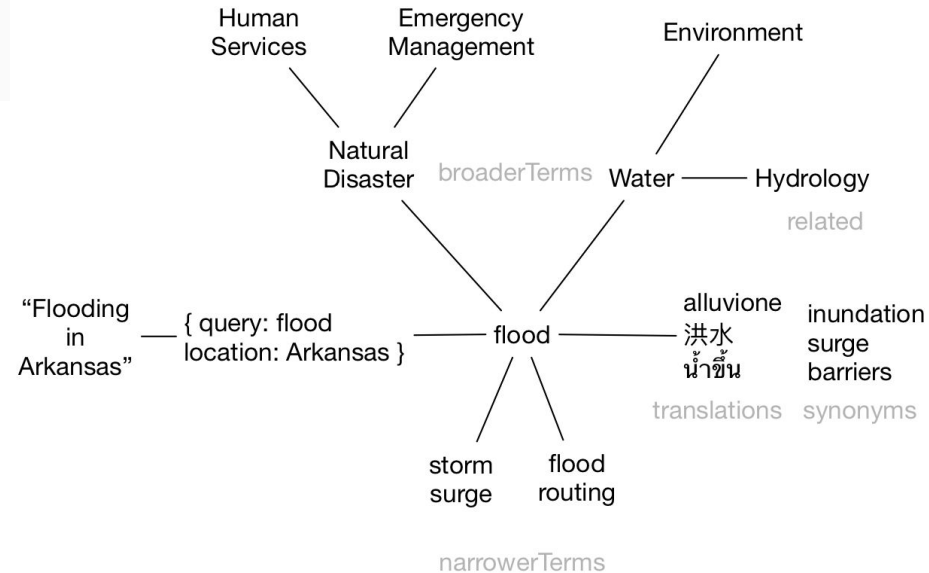
Healthy

Agriculture
Disease
Health-Care



Well-Run

Boundaries
Financial
Planning & Land Use



Semantic web technologies can bridge users' terms with technical metadata.

query upload files edit info

SPARQL query

To try out some SPARQL queries against the selected dataset, enter your query here.

EXAMPLE QUERIES

Selection of triples Selection of classes

PREFIXES

rdf rdfs owl xsd

SPARQL ENDPOINT

http://34.229.180.217:8080/fuseki/category/query

CONTENT TYPE (SELECT)

JSON

```
2 PREFIX hub: <http://www.esri-hub.com/vocab/>
3 PREFIX owl: <http://www.w3.org/2002/07/owl#>
4 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
5 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
6 PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
7 PREFIX ontology: <http://wordnet-rdf.princeton.edu/ontology#>
8 PREFIX loc: <http://id.loc.gov/authorities/subjects/>
9
10 SELECT ?label ?synonym
11 WHERE {
12   ?term skos:prefLabel ?label .
13   ?term skos:altLabel ?synonym .
14   FILTER contains( lcase(?label), "agriculture")
15 }
```

Term Expander

Expands a term using SPARQL query against Fuseki

Term: agriculture

Fetch dataset from Elasticsearch

```
{
  "synonyms": [
    "Farming",
    "Husbandry",
    "agribusiness",
    "agricultura",
    "agroindustria",
    "factory farm"
  ],
  "translation": [
    "تربية الحيوان",
    "زراعة",
    "فلاحة",
    "agricultura",
    "landbrug",
    "laborantza",
    "nekazaritza",
    "الفلاحة",
    "maanviljely",
    "maanviljelys",
    "maatalous",
    "agricultura",
    "cucuk tanam",
    "pengebuman",
    "penternakan",
  ]
}
```

Search for traffic | Geospatial

Secure | https://osav-usdot.opendata.arcgis.com/datasets?q=traffic&sort_by=relevance

Transportation.gov U.S. Department of Transportation

Geospatial at the Bureau of Transportation

traffic

SEARCH WITHIN MAP

1-10 of 28 results

Relevance

42 attributes | 34439 locations |

Fatal Motor Vehicle Accidents acc aux (from Open Data)
Shared by USDOT_BTS
The Fatality Analysis Reporting System (FARS) dataset is as of October 1, 2017, and is part of the U.S. Department of Transportation (USDOT)/Bureau of Transportation Statistics's (BTS's) National Transportation Atlas Database (NTAD). One of the primary objectives of the National Highway Traffic Safety

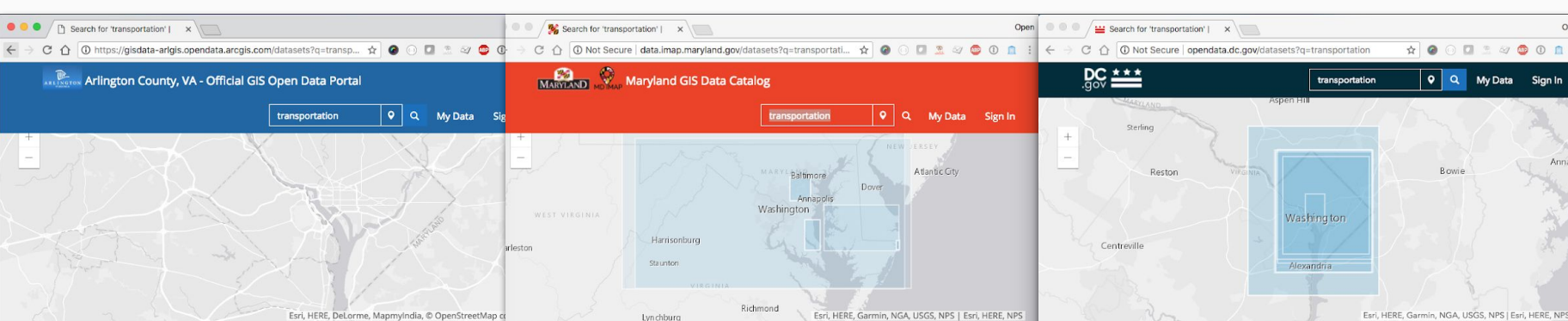
5 attributes | 55322 locations |

Fatal Motor Vehicle Accidents violatn (from Open Data)
Shared by USDOT_BTS
The Fatality Analysis Reporting System (FARS) dataset is as of October 1,

My Favorite

click ☆ on any to add to your

11



No datasets found.
Please try different
search terms.

[Browse All Datasets](#)

Filter By

Tags

Maryland (180)
Wms (169)
Kml (168)
Md (168)
Md Imap (168)

[More ▼](#)

Source

**ArcGIS Online for
Management (171)**

Content Type

spatial dataset (171)
web mapping application (14)

1 - 10 of 185 results

Relevance

MDOT SHA - Transportation Projects

Shared by marshall.stevenson1

The Maryland Department of Transportation (MDOT) Maryland State Highway Administration (SHA) has established an innovative approach for presenting its transportation projects

Custom License 2/2/2018 Web Mapping Application



Maryland Recreational Uses - Charter Transport

Shared by mdimapdatacatalog

This is a MD IMAP hosted service layer. Find more information at <http://imap.maryland.gov>. Maryland, through its Coastal Zone Management (CZM) Program, is collecting information on how

Custom License 7/1/2014 Spatial Dataset 4 Rows



Maryland Local Transit - Regional Transportation Agency Stops

Shared by mdimapdatacatalog

This is a MD IMAP hosted service. Find more information on <http://imap.maryland.gov>. This layer displays RTA Bus Stops. Data was retrieved from GTFS feed. Created by CMRT. Layer

Custom License 5/27/2016 Spatial Dataset 796 Rows



MDOT SHA - Transportation Alternatives Program (TAP)

Shared by marshall.stevenson1

As part of the Federal Highway Administration Surface Transportation Program, the Transportation Alternatives Program (TAP) is a reimbursable federal aid funding program

Custom License 2/2/2018 Web Mapping Application



Maryland Local Transit - Calvert County Public Transportation Stops

Filter By

Tags

Transportation (363)
Washington Dc (343)
District Of Columbia (338)
Dc (337)
Washington (282)

[More ▼](#)

Source

City of Washington, DC (387)

Content Type

spatial dataset (284)
table (99)
document (4)

1 - 10 of 387 results

Relevance

Transportation Study Areas

Shared by DCGISpendata

Transportation Study Area locations. The dataset contains locations and attributes of TransportationStudyAreas, created as part of the District of Columbia, Department of Transportation

Custom License 1/29/2018 Spatial Dataset 77 Rows



Construction Permits (via DDOT TOPs)

Shared by DCGISpendata

This data sets shows construction permits from DDOT's Transportation Online Permitting System. <https://tops.ddot.dc.gov/>

Custom License 1/29/2018 Spatial Dataset 110,533 Rows



Service Roads

Shared by DCGISpendata

Street Roadway Segments. A single line, segmented at all intersections (alley, service road, drive, street, and driveway centerline types), representing each street in the District. They

Custom License 12/25/2013 Spatial Dataset 124 Rows



Tour Bus Drop-off Pick-up Locations

Shared by DCGISpendata

Tourbus Loading and Unloading Locations. The dataset contains locations and attributes of locations for Tourbus loading/unloading locations, created as part of the District of

Custom License 1/29/2018 Spatial Dataset 29 Rows



Guardrails and Barriers

Shared by DCGISpendata

Guardrails and barriers. This dataset was collected as part of the planimetric mapping project. Hidden features were added as enhancements to this dataset.



Improved spatial discovery can help us realize the **socioeconomic value** of data.

Spatial data integration and semantic search can improve the discovery of valuable field station data in the near future.



SANTA CRUZ ISLAND

The largest of the Channel Islands and the site of important archaeological resources and many endemic plant and animal species including the island fox.



SEDGWICK

Over nine square miles at the base of Figueroa Mt. encompassing a diverse array of geological features and a wide variety of vegetation types and wildlife



CARPINTERIA SALT MARSH

Protects a critically important estuarine ecosystem that supports many sensitive plant and animal species.



COAL OIL POINT

Includes coastal dune and wetland ecosystems that provide critical habitat for migratory birds and threatened and endangered species.

Increasing **semantic interoperability** helps track progress toward collaborative goals.



Thank you!

Werner Kuhn, UCSB (graduate advisor)

Mark Schildhauer, NCEAS (project supervisor)

Katja Seltmann, UCSB (master's committee)

Andrew Turner and Pranav Kulkarni, Esri

Research and Development (project supervisors)

spatial@ucsb
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