



Research Intelligence and the VIVO Platform: A Case Study from Texas A&M University

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VIVO 2020 Conference
<https://vivoconference.org/vivo2020/>

Research at Texas A&M University



Land-Grant, Sea-Grant, &
Space-Grant Institution

128

Undergraduate Degree
Programs

300

Graduate Degree
Programs

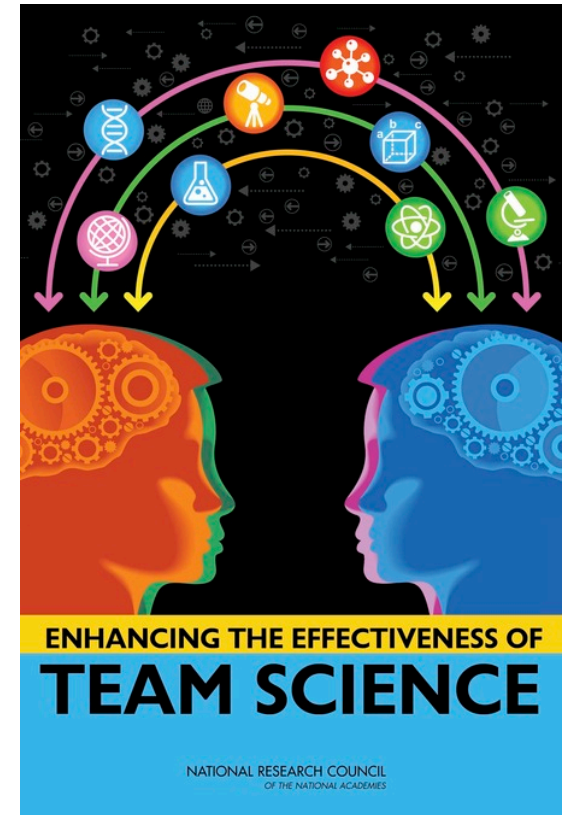
- Member of the Association of American Universities (AAU)
- Colleges and Schools: **19**
- Master's degree programs: **200**
- Doctoral degree programs: **100**
- First professional degree programs: **5**
- Study Abroad: **5,330 students to 105 countries each year**
- Total Faculty: **3,750**
- National Academies Faculty: **19**
- Nobel Prize: **3**
- Wolf Prize: **3**
- Research expenditures*: **\$905 million+ in FY2017**

* #16 nationally, National Science Foundation, 2015

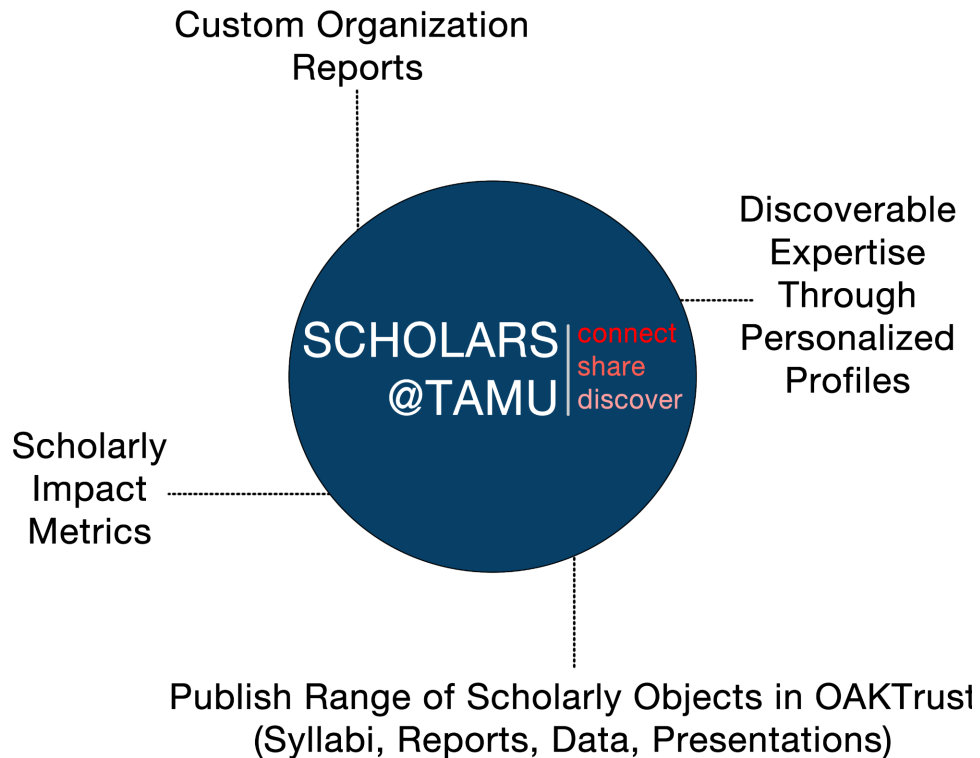
TAMU Initiatives

- Expanding interdisciplinary research
- Enhancing the significance & impact of our research => reputation
- Research translation to address grand challenges
- Faculty success in traditional & alternative tracks

In 2015, the Library started exploring the development of RIM that could directly support these initiatives.



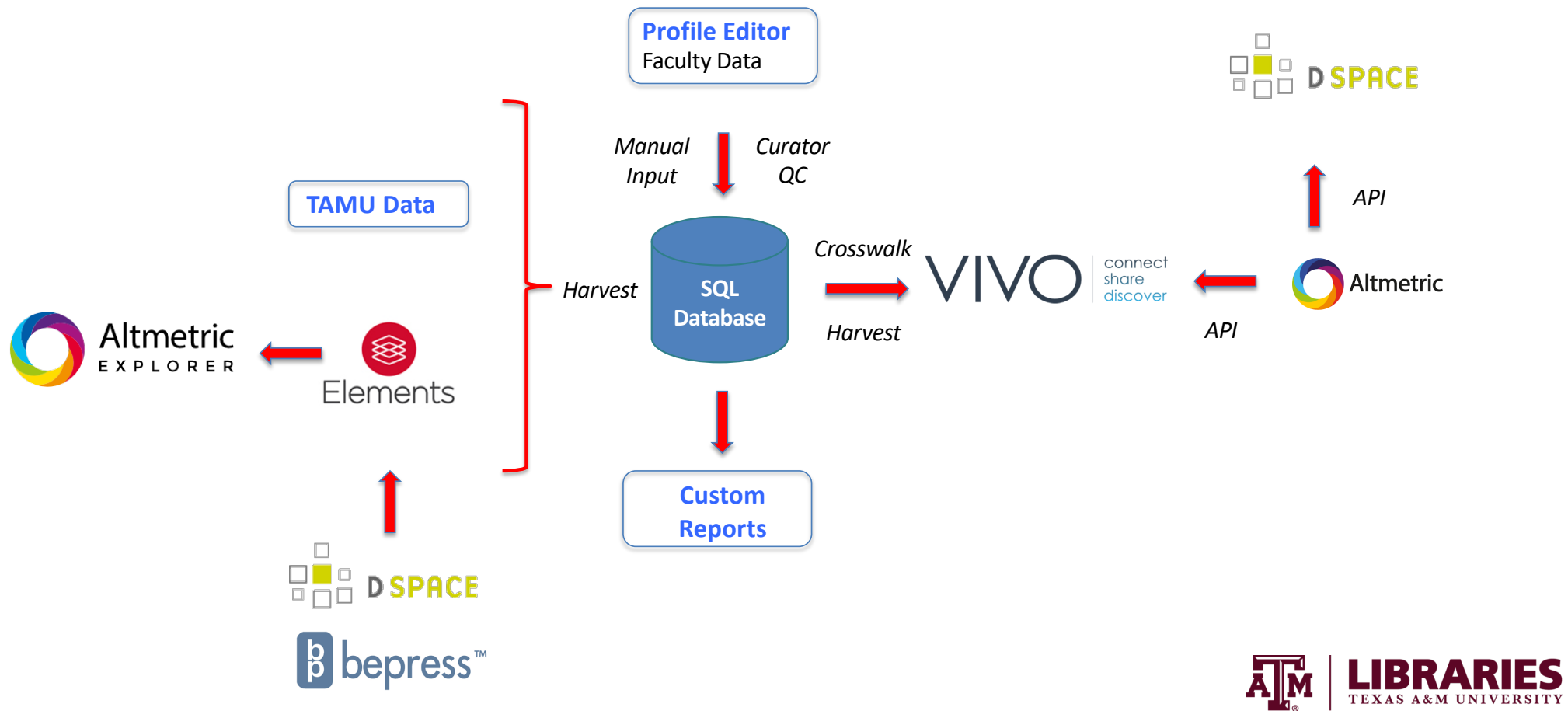
Scholars@TAMU Use Cases



- Faculty Digital Identity & Reputation
- Discover Researcher Expertise
- Data Reuse Across Campus
- Research Intelligence

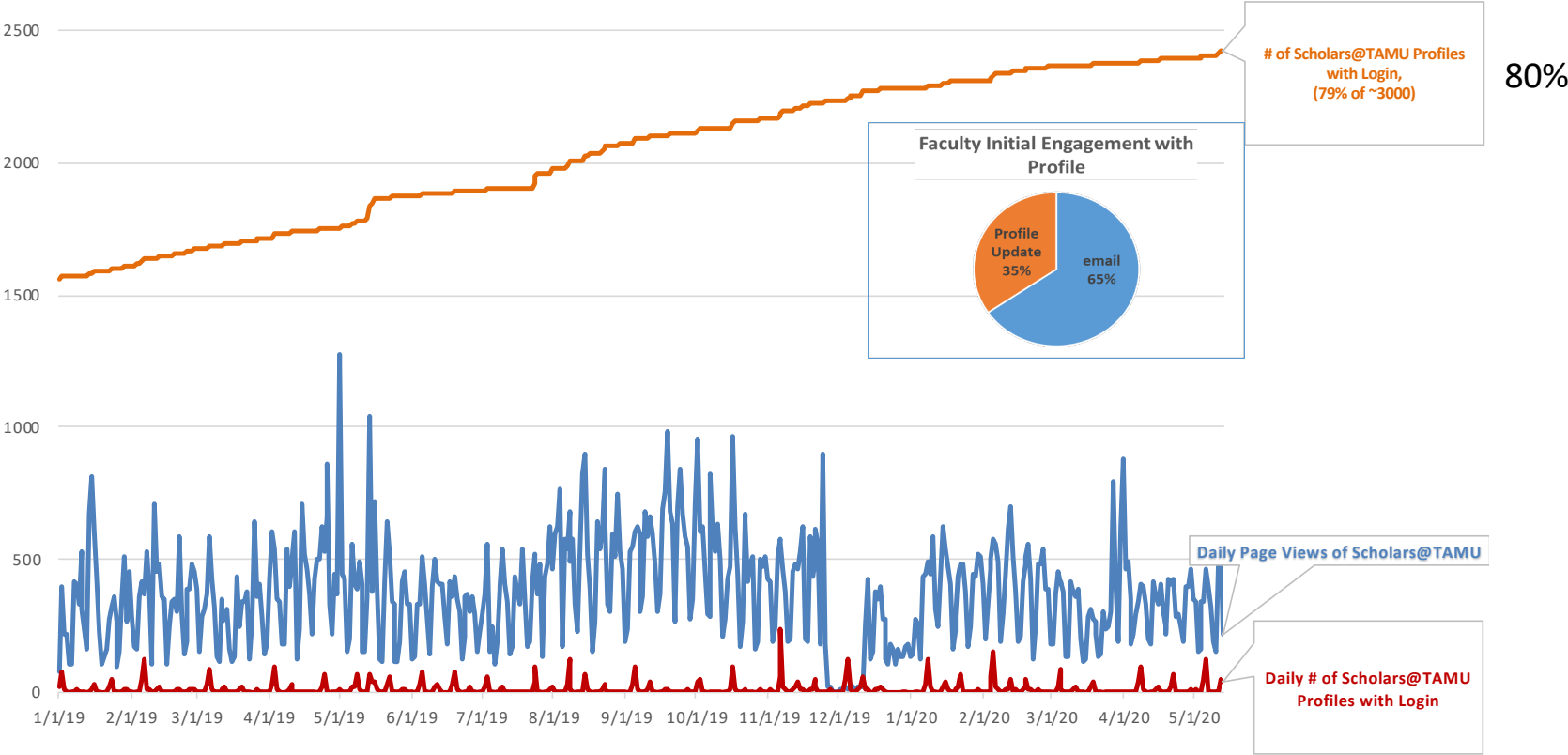
<http://scholars.tamu.edu/>

Scholars@TAMU RIM Ecosystem



Authoritative, Structured Data That Can Be Reused

Faculty Engagement with Scholars@TAMU (2019-2020)



Research Intelligence as Emerging Use Case



Research Intelligence: Establish, execute, and evaluate institutional research strategy & evaluation

- Principle Investigators
- College and Department Program Reviews
- Vice President of Research

Takes advantage of linked data!

Bryant, R., et al. 2017. *Research Information Management: Defining RIM and the Library's Role*. Dublin, OH: OCLC Research. <https://doi.org/10.25333/C3NK88>

Research Intelligence Case: Water Research

Characterize the strengths and gaps in water-related research at Texas A&M

Word search to include: water, waterways, water and climate, floods, hydrogeology, hydrobiology, water security, watershed, aquifers, ice, water management, contamination, saltwater, freshwater desalination, salt water intrusion, water policy, water technology (and any other term you might suggest related to “water”)

Herbert, Bruce | Professor

Positions

- ▶ Director, Office of Scholarly Communications and Professor, [University Libraries, Texas A&M University](#)
- ▶ Professor, [Geology and Geophysics, College of Geosciences](#)

Contact Info

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Websites

- ▶ [Google Scholar](#)
- ▶ [Library Profile](#)
- ▶ [Mendeley profile](#)
- ▶ [My Research Homepage](#)

ORCID

[0000-0002-6736-1148](#)

Research Areas

[Academic-industrial collaboration](#) | [Communication in learning and scholarship](#) | [Open access](#) | [Research--Management](#) | [Soils--Quality](#)

Chaired Theses and Dissertations

- Artan, Sinem (2011-05). [Aeolian Delivery of Organic Matter to a Middle Permian Deepwater Ramp](#). Master's
- Harvey, Omar R. (2010-05). [Mechanisms of Organic-inorganic Interactions in Soils and Aqueous Environments Elucidated using Calorimetric Techniques](#). Doctoral

147 Researchers Identified by
Research Overview

Research Intelligence Case: Water Research

Most Common Keywords Associated with Publications of Self-Identified, Water-Related Faculty, by College								
College:	Agriculture & Life Sciences		TAMU-Galveston		Engineering		Geosciences	
Keywords:	count	keyword	count	keyword	count	keyword	count	keyword
	42	Swat	9	Gulf Of Mexico	11	Climate Change	4	Geotraces
	13	Water Quality	7	Phytoplankton	11	Entropy	3	Gulf Of Mexico
	12	Climate Change	6	Corexit	9	Uncertainty	2	Carbon Isotopes
	11	Swat Model	5	Diatoms	8	Hydrological Drought	2	Rivers
	10	Hydrology	5	Oil	8	China	2	Stable Isotopes
	10	Evapotranspiration	4	Seawater	7	Groundwater	2	Paleoceanography
	10	Water Use Efficiency	4	Photosynthesis	6	Drought	2	Ocean Observing
	9	Irrigation	4	Petroleum Pollution	6	Precipitation	2	Turbulence
	8	Biomass	3	Texas	6	Soil Moisture	2	Pycnocline
	8	Salinity	3	Stable Isotopes	6	Copula	2	Deepwater Horizon
	8	Water	3	Microgel	5	Swat	2	Benthic Storms
	8	Brazil	3	Water Pollutants, Chemical	5	Artificial Neural Network	2	Eddy Kinetic Energy
	7	Nitrogen	3	Marine Oil Snow	5	Tarim River Basin	2	Upwelling
	7	Deficit Irrigation	2	Ecosystem	4	Biodegradation	2	Gdgt
	7	Animals	2	Population Dynamics	4	Water Pollutants, Chemical	2	Ring Index
	6	Hydrological Modeling	2	Salinity	4	NDVI	2	TEX86
	6	Soil Moisture	2	Seasons	4	Watershed	2	Arctic Ocean
	6	Remote Sensing	2	Chl Fluorescence	4	Water Quality	2	Water
	6	Drought	2	Coccolithophore	4	Water Reuse	2	Biogeochemistry
	5	Phosphorus	2	Diatom	4	Temperature	1	Fire-oak Hypothesis
	5	Phytoplankton	2	Phaeodactylum Tricornutum	4	Entropy Theory	1	Mesophication
	5	Soil And Water Assessment Tool	2	Migration	4	Texas	1	Fire Suppression
	5	Ecosystem Services	2	Natal Origin	4	Irrigation	1	Oak Decline
	5	Prymnesium Parvum	2	Otolith Chemistry	4	Irrigation Water Allocation	1	Southern Appalachian Mountains

Characterize keywords of water-related research by College

Research Intelligence Case: Water Research

Python Analysis of all linked data harvested as a JSON File through our API.

Water Research VPR Report

[Jian Tao](#), Texas A&M University

April 28, 2020

Data

TAMU_scholar.csv is downloaded from [TAMU Scholar](#)

The profiles of all 2938 researchers from Scholars@TAMU have been downloaded and used in the analysis. The total is about 83MB in json format.

Analysis

We carry out keyword-based search for each scholar. This Jupyter notebook loads the profiles of all the scholars and match the provided keywords against those in each scholar's profile. Both the matched keywords and the number of matches are stored for future analysis.

```
In [96]: import os
import requests
import json
import csv
from tqdm import tqdm
import pandas as pd
import matplotlib.pyplot as plt
import networkx as nx
```

Parameters

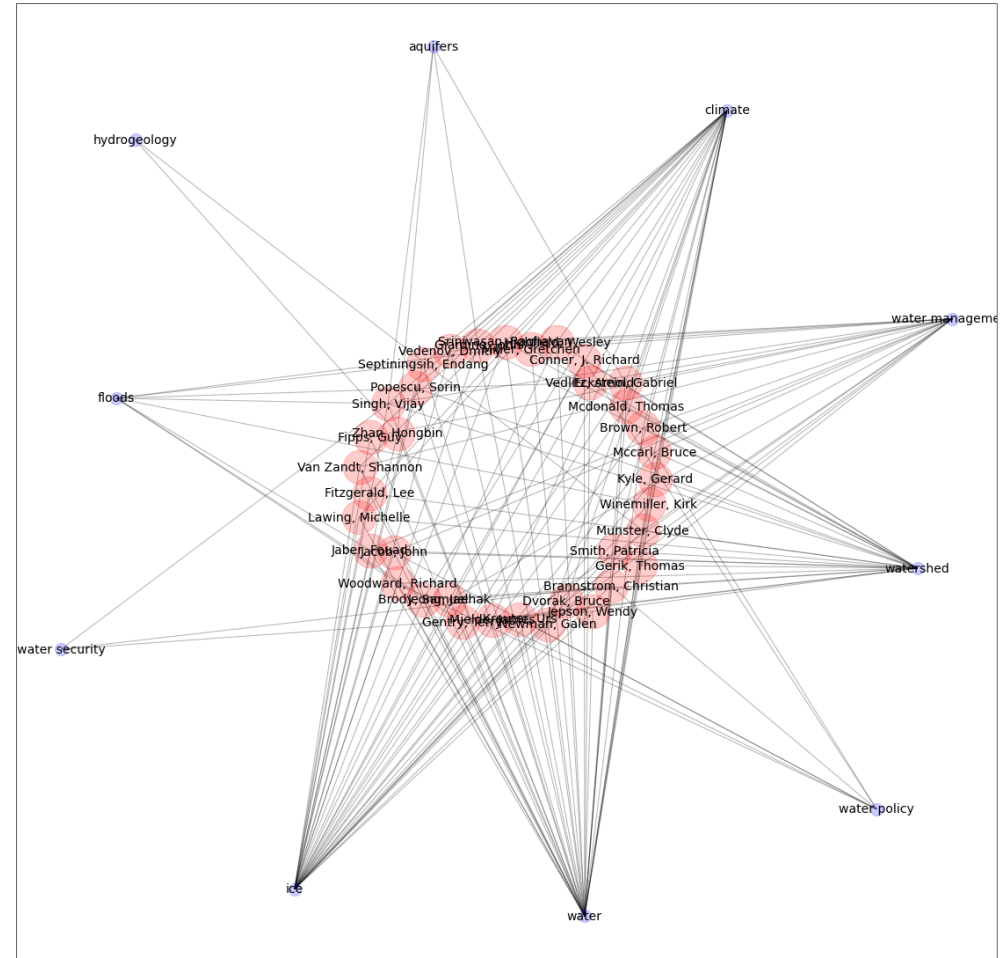
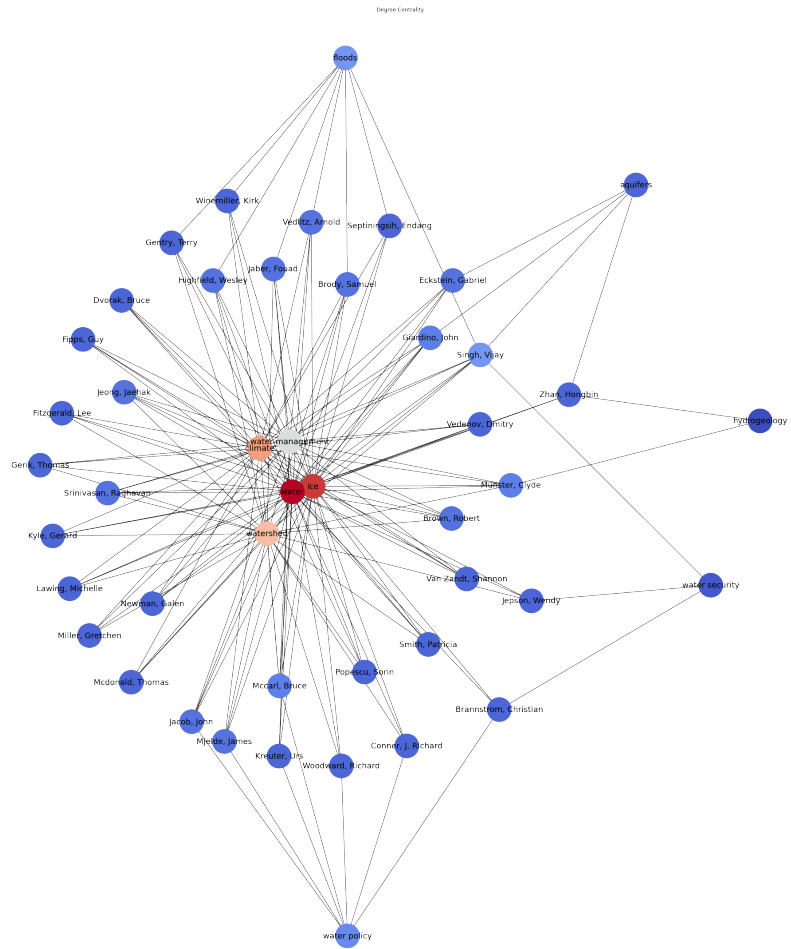
These are the parameters for the script.

```
In [272]: # we have the keywords for three domains
# possible domains are: water, space, and health
domain="water"
# minimum number of matches
# space: 10, water: 4
min_num_matches = 4 #

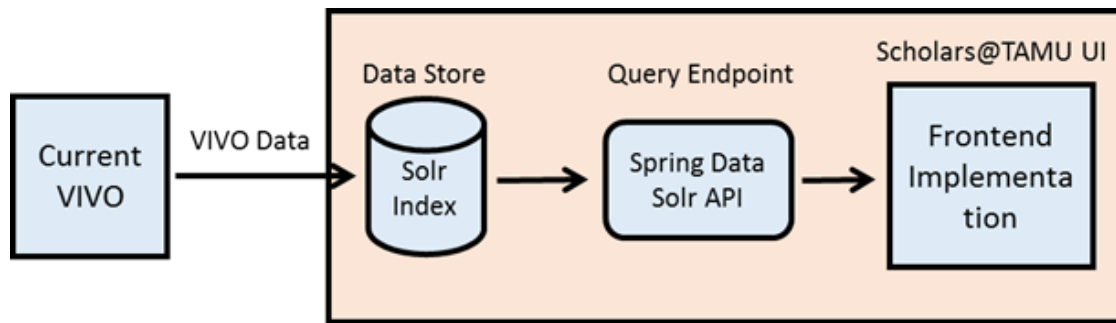
all_scholar_file = "TAMU_scholar.csv"
api_base_url = "https://api.library.tamu.edu/scholars-discovery/individual/"
image_base_url = "https://vivo.library.tamu.edu/vivo"
profile_dir = "scholars"

all_scholar_url = "https://api.library.tamu.edu/scholars-discovery/individual/search/export?fl=firstName,lastName,preferredTitle,overview,positions,positionOrganization,individual&type.type=STRING&type.pageSize=10&type.pageNumber=1&type.sort=COUNT,DESC&positionOrganization.type=STRING&positionOrganization.pageSize=10&positionOrganization.pageNumber=1&positionOrganization.sort=INDEX,ASC&researchAreas_nested_facets.type=STRING&researchAreas_nested_facets.pageSize=10&researchAreas_nested_facets.pageNumber=1&researchAreas_nested_facets.sort=COUNT,DESC&class.filter=Persons&class.opKey=EQUALS&filters=class&sort=name_sort,ASC&page=1&export=firstName,First%20name&export=lastName,Last%20name&export=preferredTitle,Preferred%20title&export=overview,Overview&export=positions,Position&export=positionOrganization,Department&export=individual,Individual"
# the keywords here will be domain specific
```

Research Intelligence Case: Water Research



VIVO Development at Texas A&M



- API provides read-only JSON data through a REST interface
- Graph analysis methods to address common research intelligence needs
- Dashboards of organization research

We have created a new user interface for VIVO that is aligned with VIVO Scholar – the community’s project of UI development. Just like VIVO Scholar it takes advantage of the Discovery Service as the Query Endpoint.

Final Thoughts – Looking for Collaborators

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Don Joon Lee

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Scholars@TAMU Code

- Scholars Discovery
<https://github.com/vivo-community/scholars-discovery>
- Scholars @TAMU is a fork of
<https://github.com/vivo-community/scholars-angular>
- Scholars@TAMU
<https://github.com/TAMULib/scholars-angular>
- Scholars@TAMU API
<https://api.library.tamu.edu/scholars-discovery/api>