Searvey

github.com/oceanmodeling/searvey

NOAA / EC-JRC

Office of Coast Survey

European Commission

Scope

- Unified catalogue of observational data including near real time

- Real time data extraction and visualization to facilitate comparison with numerical models

- On demand data retrieval from multiple sources that currently include:

  o COOPS - U.S. Center for Operational Oceanographic Products and Services

  o IOC - Flanders Marine Institute (VLIZ); Intergovernmental Oceanographic Commission
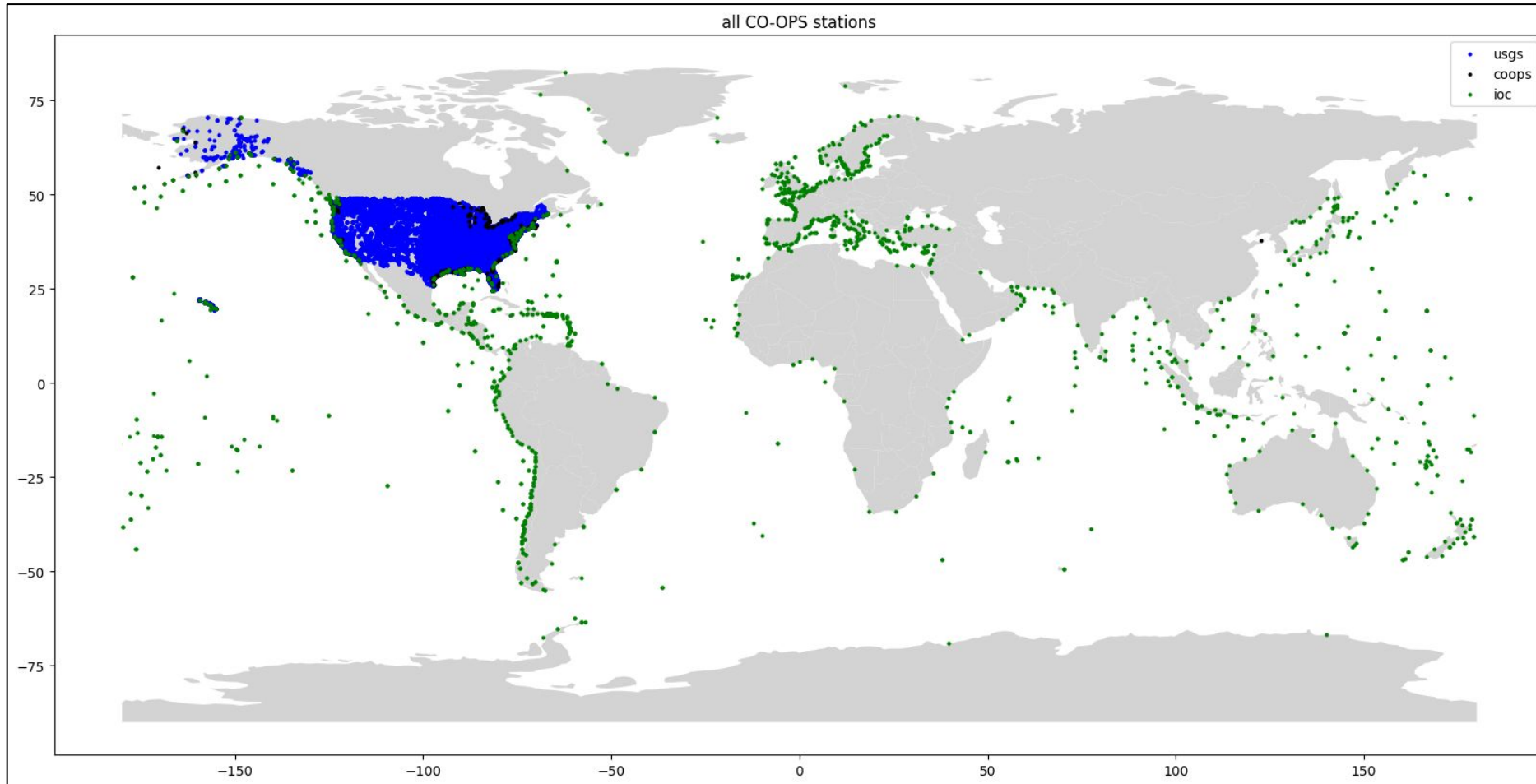
  o USGS - U.S. Geological Survey

Scopes :

- **Standardized** : pandas / xarray

- **Versatile** : `pip install searvey` or `conda install -c conda-forge searvey`

- **Reproducible** : notebooks and tests

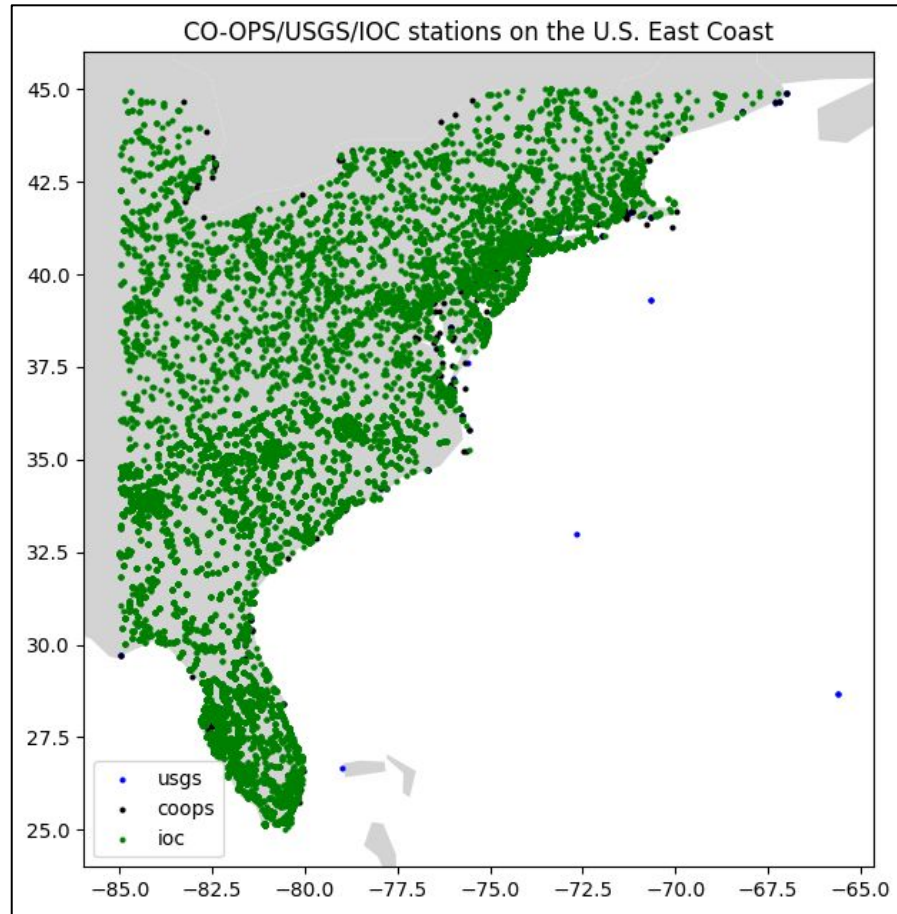- **User friendly** : simple high-level functions

Extract Stations

```python
from searvey import coops
from searvey import usgs
from searvey import ioc

ioc_stations = ioc.get_ioc_stations()
coops_stations = coops.get_coops_stations()
usgs_stations = usgs.get_usgs_stations()
```


all CO-OPS stations

Office of Coast Survey

European Commission

Extract stations in areas:

CO-OPS/USGS/IOC stations on the U.S. East Coast

```
import shapely
east_coast = shapely.geometry.box(-85, 25, -65, 45)
east_coast_ioc = ioc.get_ioc_stations(region = east_coast)
east_coast_coops = coops.get_coops_stations(region = east_coast)
east_coast_usgs = usgs.get_usgs_stations(region = east_coast)
```
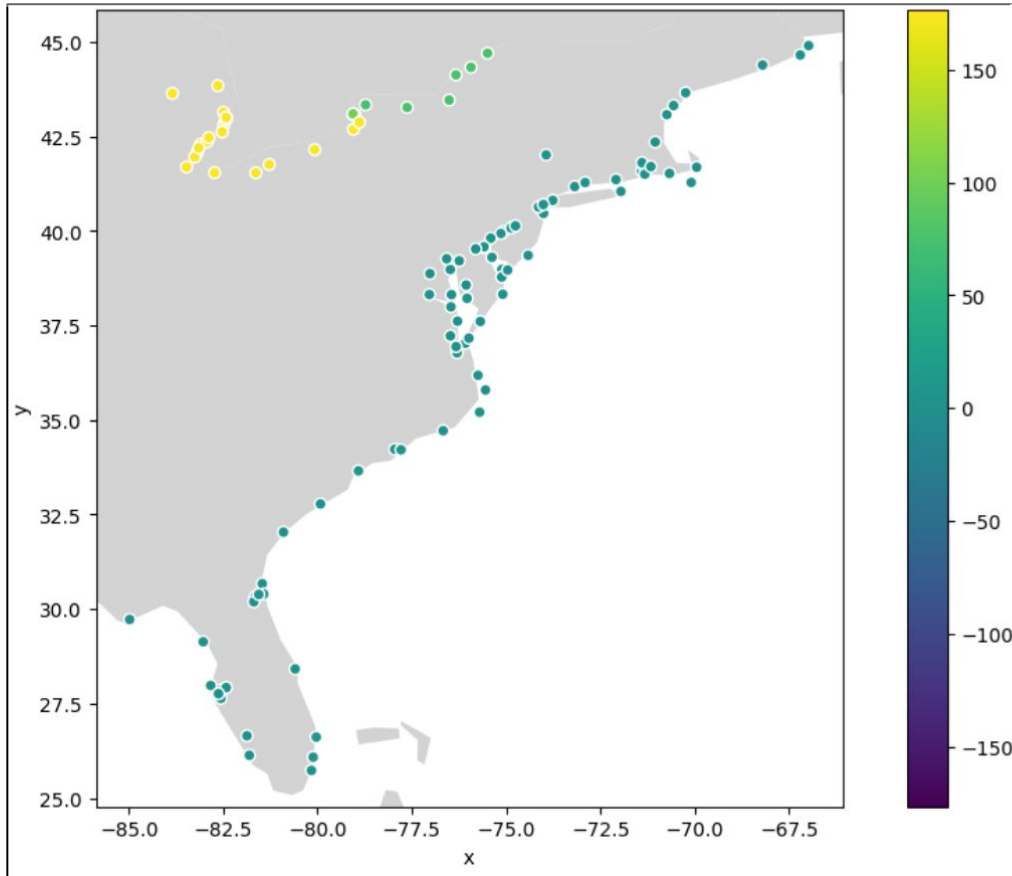
Output: Pandas Dataframe

nos_id	nws_id	name	state	status	removed	geometry
8726679	TSHF1	East Bay Causeway	FL	active	<NA>	POINT (-82.42575 27.92889)
8726694	TPAF1	TPA Cruise Terminal 2	FL	active	<NA>	POINT (-82.44586 27.94297)
9044036	FWNM4	Fort Wayne	MI	active	2005-04-29 23:59:00,2005-04-29 00:00:00,2001-1...	POINT (-83.09263 42.29891)
9075035	ESVM4	Essexville	MI	active	2007-03-28 23:59:00,2007-03-28 00:00:00,2007-0...	POINT (-83.84680 43.64040)
9052076	OCTN6	Olcott	NY	active	2007-08-06 07:10:00,2007-06-01 23:59:00,2007-0...	POINT (-78.72733 43.33839)
...	...	...	...	...	...	...
8654400	CFPN7	Cape Hatteras Fishing Pier	NC	discontinued	2018-09-19 23:59:00,2003-09-18 23:59:00,2003-0...	POINT (-75.63500 35.22330)
8720625	RCYF1	Racy Point, St Johns River	FL	discontinued	2019-08-05 14:00:00,2017-06-14 15:36:00,2017-0...	POINT (-81.54830 29.80170)
8423898	FTPN3	Fort Point	NH	discontinued	2020-04-13 00:00:00,2014-08-05 00:00:00,2012-0...	POINT (-70.71056 43.07139)
8726667	MCYF1	Mckay Bay Entrance	FL	discontinued	2020-05-20 00:00:00,2019-03-08 00:00:00,2017-0...	POINT (-82.42500 27.91330)
8419317	WELM1	Wells	ME	discontinued	2022-08-03 00:00:00,2016-08-09 12:00:00,2016-0...	POINT (-70.56330 43.32000)

172 rows × 6 columns

Office of Coast Survey

European Commission

Extract variables for selected stations:

maximum water levels observed by CO-OPS stations on the U.S.
East Coast between 2022-04-02 12:00:00 and 2022-04-02 12:30:00


```python
import shapely
from searvey.coops import coops_product_within_region water_levels
= coops_product_within_region(
    'water_level',
    region=east_coast,
    start_date=datetime(2022, 4, 2, 12),
    end_date=datetime(2022, 4, 2, 12, 30))
water_levels
```

xarray.Dataset

▶ Dimensions:	(**nos_id**: 1, **t**: 7206)		
▼ Coordinates:			
nos_id	(nos_id)	object	'1612480'
t	(t)	datetime64[ns]	2022-04-02T12:00:00 ... 2022-05-...
nws_id	(nos_id)	<U5	'MOKH1'
x	(nos_id)	float64	-157.8
y	(nos_id)	float64	21.43
▼ Data variables:			
v	(nos_id, t)	float32	1.406 1.409 1.414 ... 1.328 1.331
s	(nos_id, t)	float32	0.001 0.002 0.002 ... 0.001 0.002
f	(nos_id, t)	object	'0,0,0,0' '0,0,0,0' ... '0,0,0,0'
q	(nos_id, t)	object	'v' 'v' 'v' 'v' ... 'v' 'v' 'v' 'v'
▶ Indexes: (2)			
▶ Attributes: (0)			

Office of Coast Survey

European Commission

More info at searvey.readthedocs.io

CO-OPS/USGS/IOC stations on the U.S. East Coast

water level observed by CO-OPS station 1612480 ("Mokuoloe") between 2022-04-02 12:00:00 and 2022-05-02 12:30:00

Office of Coast Survey

European Commission