Smart Data for Smart Infrastructure Information

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Innovation in 3D

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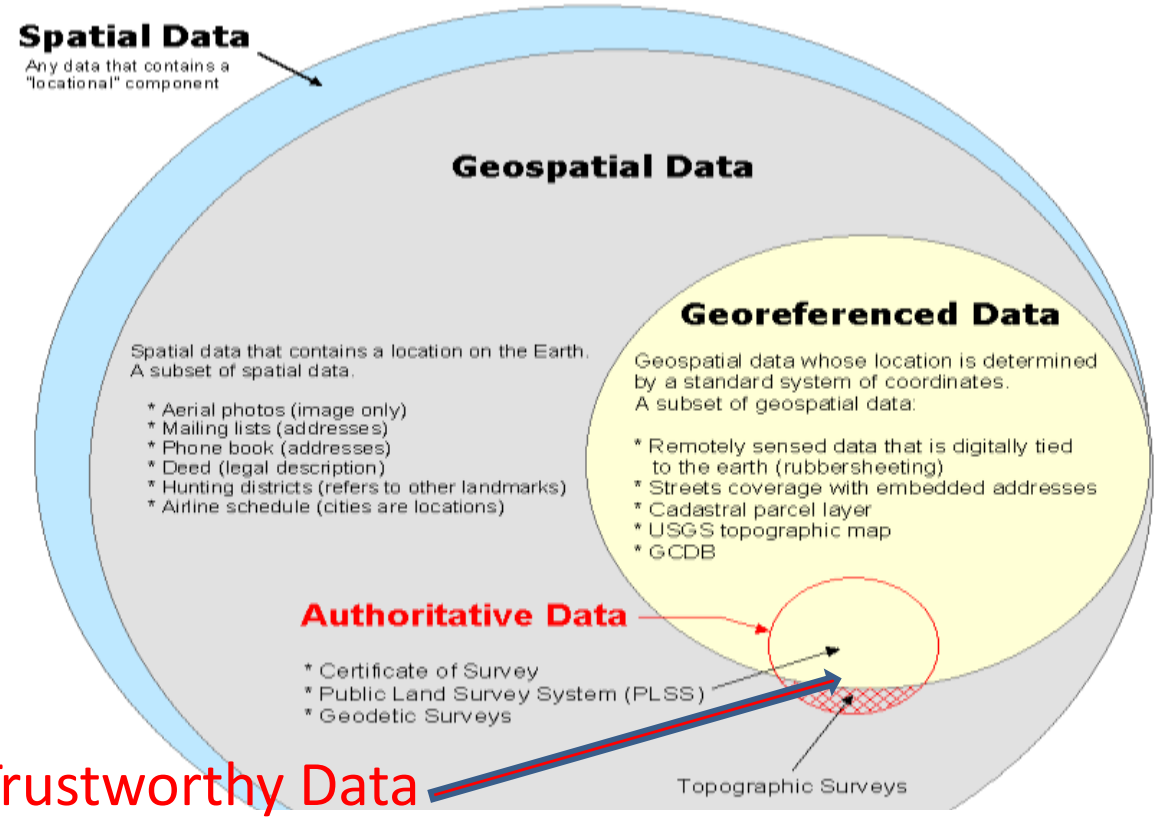
Smart Cities and Lidar

The explosive growth of cities is a tremendous challenge for the Economic, Environmental and Social impact on livability for the citizens.

The incredible complexity of todays Cities means Policy Makers and Urban Managers increasingly need information they can trust to make reliable and impactful decisions

Authoritative Data

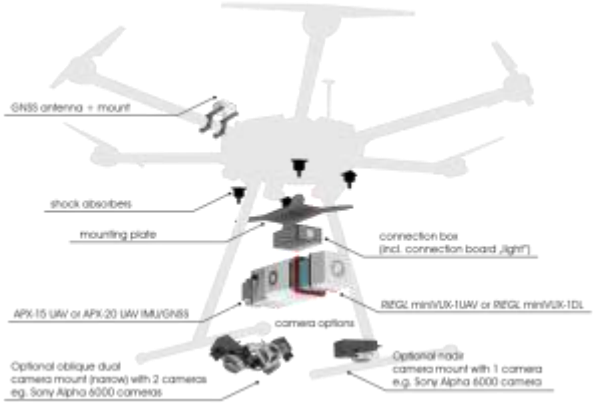


Remote Sensing and LiDAR

- ***Light detection and ranging (LiDAR) has evolved as an essential remote sensing technology needed to support high-value applications, such as flood risk management, water supply and quality, infrastructure and construction management, natural resources conservation, geologic resource assessment, and hazard mitigation. LiDAR is one of the primary technologies used to support mapping of elevation and other Earth surface characteristics.***

The Increasing Use of Drones and Lidar

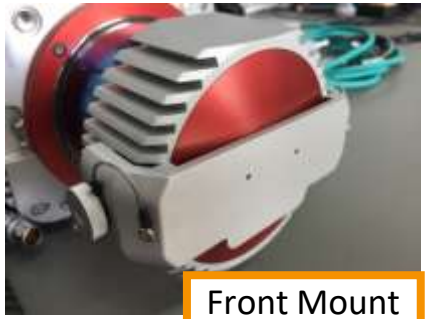
- Easy and user-friendly integration
- Successful integration in the marketplace
- Control scanner via UAV remote controller
- No user action during operation → RXPCutter



RIEGL Multi-Sensor Integrations

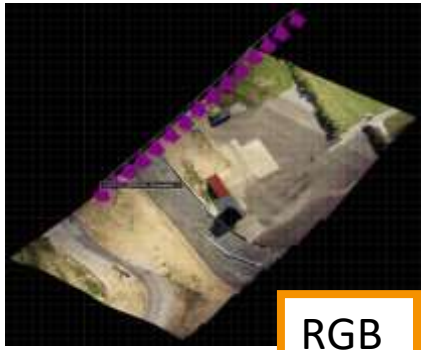
- VUX-SYS with APX-20 UAV INS/GNSS
  - Flir Tau 2 thermal camera
  - Sony Alpha 7R

weight: 5.7 kg

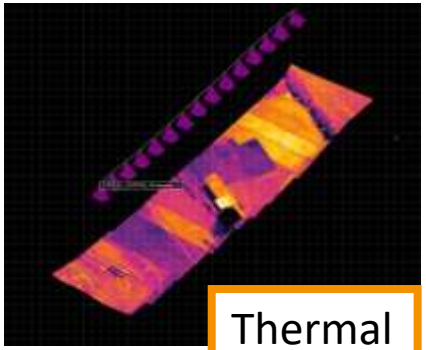


Front Mount

Integration Kit



RGB



Thermal

Multi-Sensor Options

- Oblique „wide“:
  2 x Sony A6000
- Oblique „narrow“:
  2 x Sony A6000
- Nadir:
  Sony A6000 or Sony 7R
- Thermal (Flir Tau 2):
  Sony A6000 or Sony 7R

Collaboration with Trimble - Applanix

IMU & GNSS	Applanix APX-15 UAV	Applanix APX-20 UAV	Applanix AP20
IMU Accuracy – Roll, Pitch	0.025°	**0.015°**	0.015°
IMU Accuracy – Heading	0.085°	**0.035°**	0.035°
IMU – Sampling Rate	200 Hz	**200 Hz**	200 Hz
Position Accuracy – Horizontal	< 0.05 m	**< 0.05 m**	< 0.05 m
Position Accuracy – Vertical	< 0.1 m	**< 0.1 m**	< 0.1 m

- VUX-SYS incl. APX-20 UAV:
  - much lighter (~ 1 kg)
  - same accuracy level
- VUX-SYS incl. AP20:
  - multiple-use (ALS/MLS/ULS)
  - 4 cameras (ALS/MLS/ULS)
  - Somag mount (ALS)
  - flight guidance (ALS)
  - DMI option (MLS)
  - GAMS option (MLS)

Embedded tools for real-time data acquisition

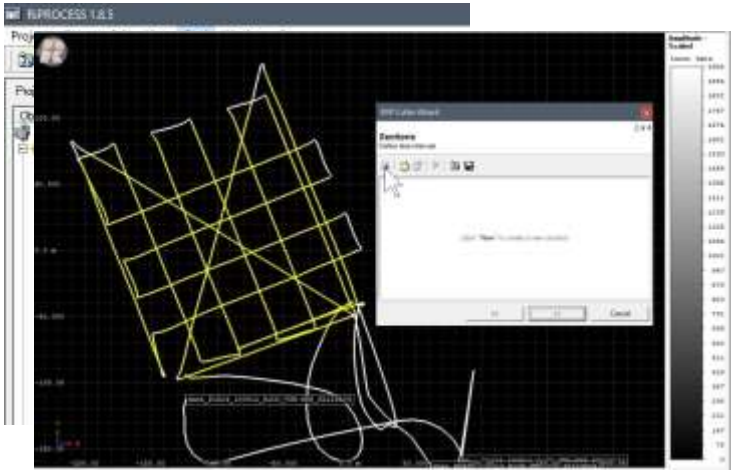
- Scanner:
  - miniVUX-1UAV
  - miniVUX-1DL
  - VUX-240

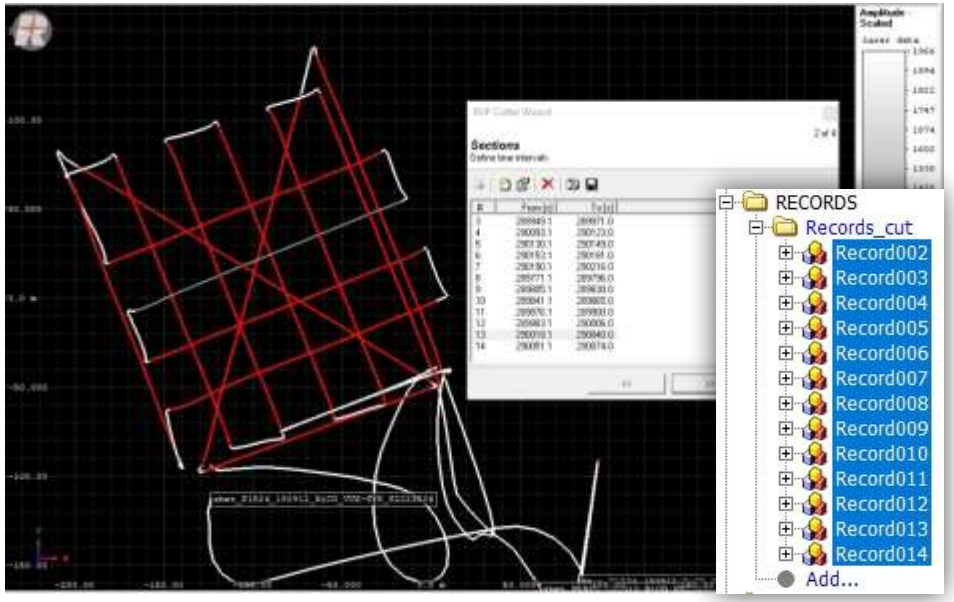
accessible by web-interface (WLAN or LAN)

- INS/GNSS:
  - APX-15 UAV
  - APX-20 UAV

RXPCutter (embedded in RiPROCESS)

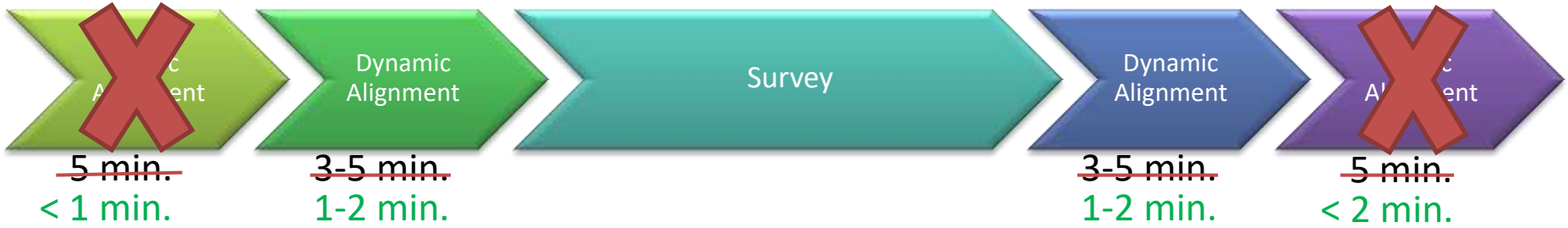
- no user action during operation required
- time in the field can be reduced
- less error at UAV on-site operation





Workflow Improvements (APX INS/GNSS)

- **Increases survey time** using improved heading initialization
  - Skip **static alignment phase** (before / after) → ~ 10 (5/5) min. less time effort
    - Automatic start-up of scanner, working/logging → no user interaction required
    - Automatic shutdown using **motion detection** → no user interaction required
  - Reduces time for **dynamic alignment phase** → ~ 3-4 min. less time effort



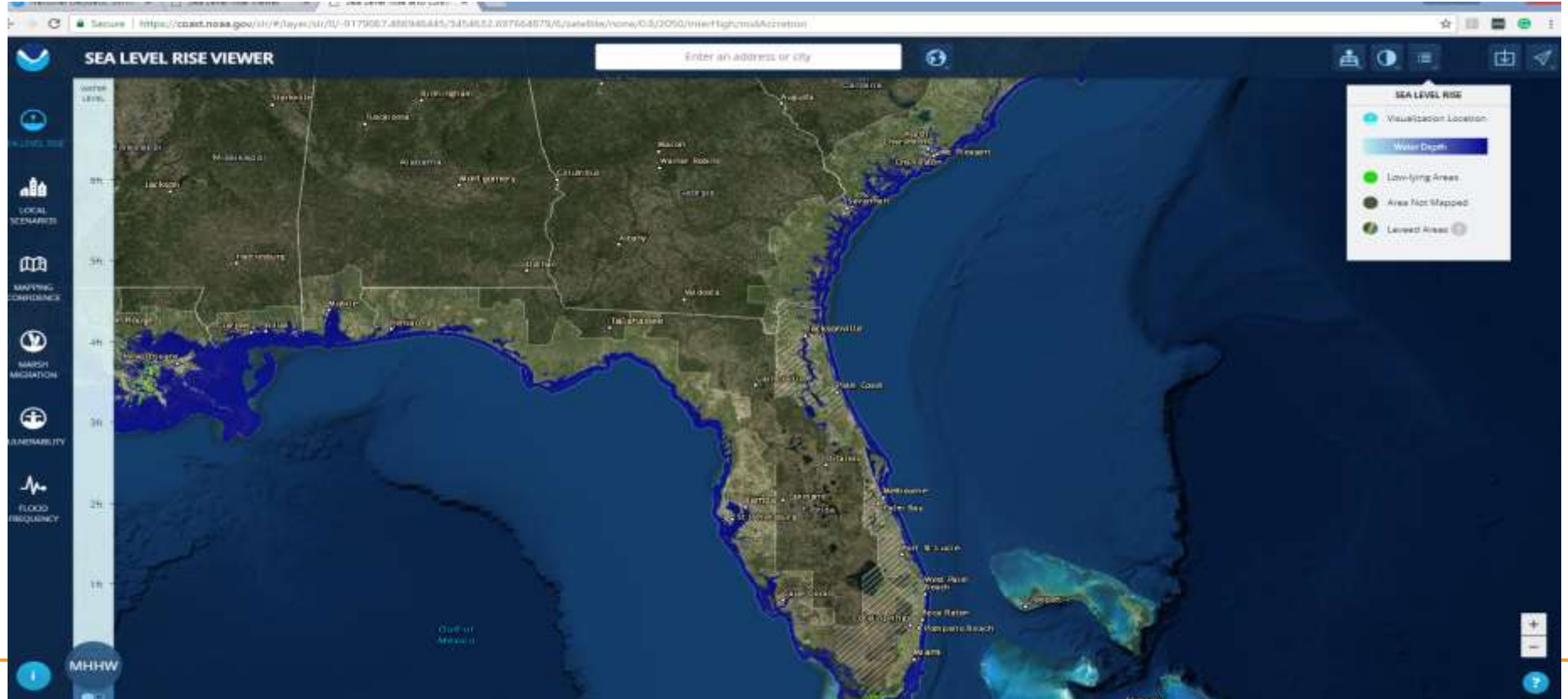
- Overall set-up time / survey time gets **maximized**! → **higher productivity**

GeoSpatial data acquisition paradigm shift

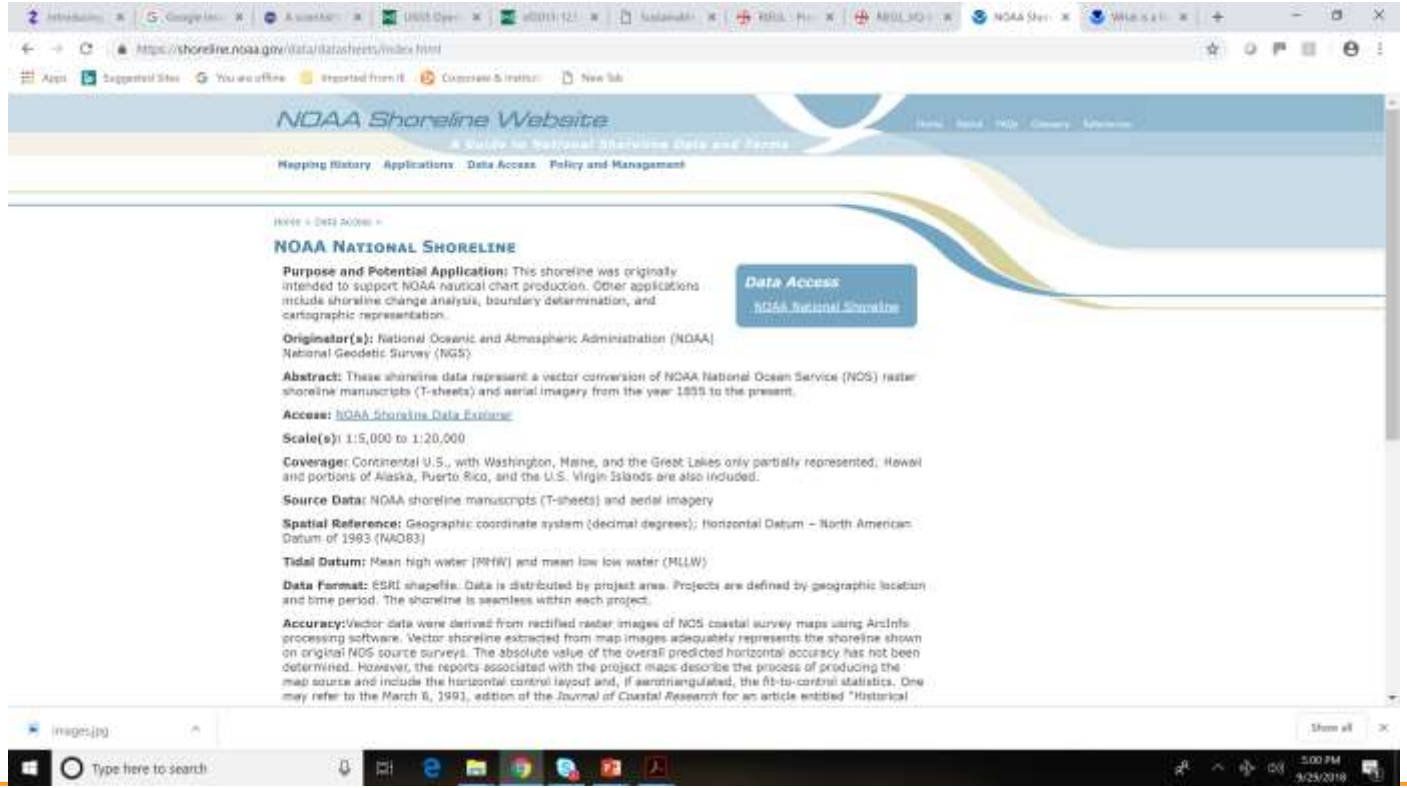
- Establish the requirements
- Determine the political and economic drivers
- Remove organizational silos,
- Remove redundancy -map it once, not many times
- Determine the cycle and refresh rates
- Establish relevant standards
- Conduct capacity planning

RIEGL

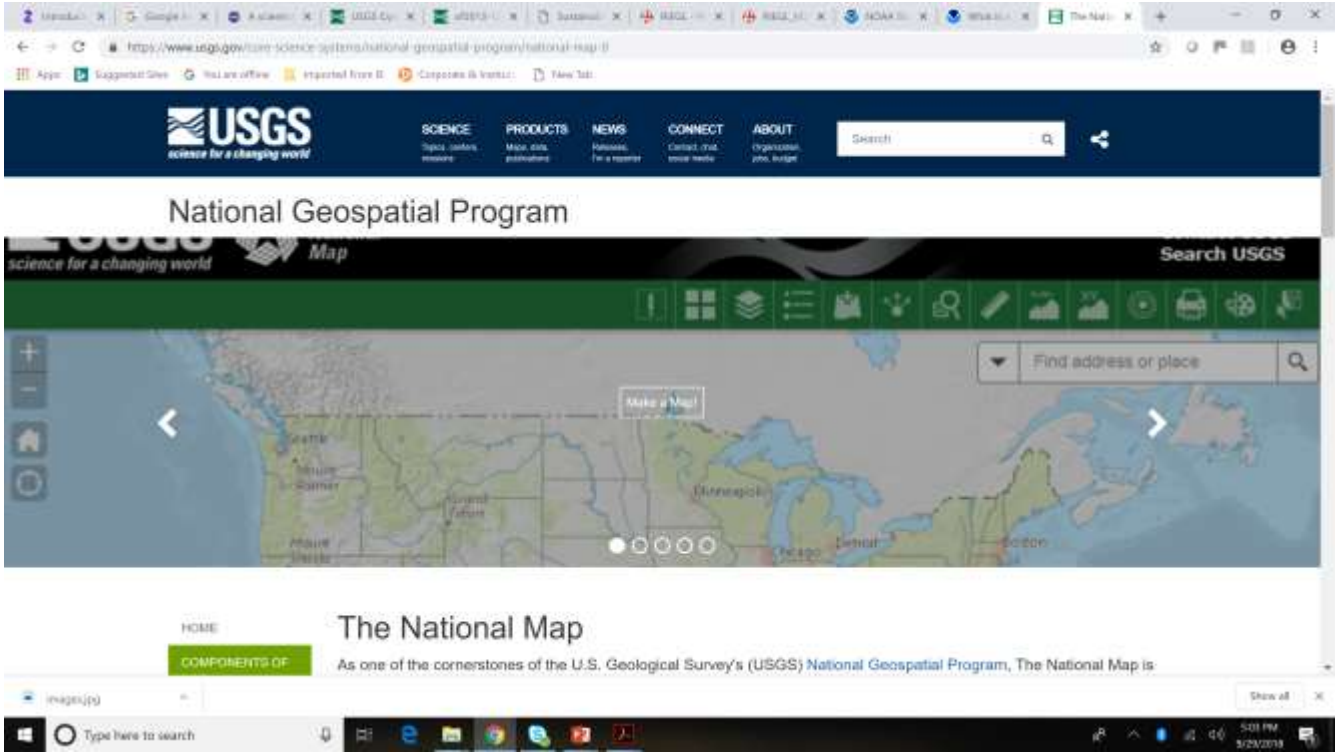
NOAA Sea Level Rise Viewer –For Consumers



NOAA Data Distribution Portal



USGS DATA DISTRIBUTION PORTAL



Important Associations

isprs
information from imagery

INTERNATIONAL HYDROGRAPHIC ORGANIZATION
1921
IHB MONACO BHI
IHO

THSOA

OGC®
Making location count.

asprs
THE IMAGING & GEOSPATIAL INFORMATION SOCIETY

U.S. Geospatial Association for Commercial Firms

MAPPS is the only national association of geospatial, mapping and photogrammetry firms with the following objectives:

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- **Expand** the geospatial market and create growth opportunities
- **Provide** professional recognition for innovation and projects
- **Increase** private sector use by government entities
- **Serve** as the voice of the private geospatial firms
- **Enhance** ability to participate in the free enterprise market
- **Promote** business interests and contest unfair competition
- **Offer** engaging business networking, professional knowledge exchange, and educational programs

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Thank you
for your kind attention!





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