

Leader: **Brittany Zajic**

Google docs note taker: ---- (determine in group)

Presenter brief summary: ---- (determine in group)

Logistics:

- Spend 5-minute max to do a quick introduction among all in your group (name, what institute do you work for)
- Determine who takes notes and who will present a summary of the outcome of this breakout this afternoon.
- Make small subgroups (3-5 people) and answer each of the questions below. Take for each question ~15-20 minutes in your small subgroup and brief back to larger breakout group (~3-5min each subgroup) for the note taker to capture into google doc.

TASKS - COMMERCIALIZATION OF SPACE

Sending more and more smaller satellites into space and 'making' space operations cheaper will benefit everyone.

Private sector commercialization of space is rapidly growing but what and how much is currently out there and offered by whom and how can this explosion of data help flood risk analysis globally?

1) What is currently being done/offered for floods and flood risk?

Group 1:

Group 2:

- Many companies and initiatives for smallsats carrying different technologies
- Smaller satellites, more frequently launched, 2-year development cycle
- Univ. to commercial companies to federal agencies are launching smallsats -- need for more vehicles
- Lots of data -- need analytics so people can consume all this data without being expert analysts
- Democratizes ownership of platforms for individual actors/countries. Data may not be shared -- but may become more available
- DG has 20-year history, quality assurance, metadata have evolved
- Planet and other smallsat operators are following the same trajectory -- but aim to do it faster
- Planet is a data provider but not a data analytic provider (and not responsible for analytics done by others)
- Calibration may be initial "poor" but can be improved on-orbit ... using new algorithms that calibrate e.g., to Landsat. Planet uses MODIS for atmospheric correction.
- Commercial satellite ecosystem is drifting from big US/DOD contracts to take advantage of the commercial markets already established by DG and earlier companies
- Also: array of end users has expanded thanks to lower prices and more accessible business models ... not to mention cloud computing resources
- New major satellites like by DLR will have open data policies ... it will/may become more difficult for them to maintain exclusive policies when commercial satellites enter that space
- Planet provides data in response to natural disasters. Planet.com/explore: open for pre- and post-event imagery. Adheres to international space charter. DG has a similar open platform for disasters as well.
- Planet: Hurricane Florence, Philippines typhoon, Indonesian tsunami
- Who participates in charter varies widely. There isn't a "charter team" -- just an agreement for sharing. Not a standard system. Most data can be accessed through HDDS (USGS). Planet does post to HDDS (USGS uploads it there).
- Planet commits e.g., 1 out of 500 staff to natural disasters. Motto is something like "Doing good on planet Earth"

- Other new satellites/organizations: (1) "shame" then into sharing data, (2) facilitate their sharing, (3) pay them to share during disasters.
- Humanitarian data exchange is another portal for sharing data. Geoplatform.gov is another thing.
- One issue is how to data providers plaster credits on GIS data (geoTiff, shapefile) that may be incorporated in other platforms/graphics?
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2) Generally, what are the access conditions (paid access/free)?

Group 1:

Group 2:

3) What would be great to have from commercial satellite operators that is currently not readily available?

Group 1:

Group 2:

- More specific algorithmic/processing details. More accuracy estimates / uncertainty sources / metadata.
- More validation data (accuracy) (accuracy in past events))
- Spaceborne lidar
- Bathymetric lidar (for depth)
- SAR tech.
- Rainfall e.g., passive microwave constellation like GPM ... but smallsat for more frequent coverage
- Orbital micro systems (microwave)
- Reduced latency ... increased observation frequency ... from all technologies
- More IR ... multispectral to distinguish water from cloud shadow etc. ..., at least a SWIR band
- Fore/aft looking tandem for DEM from stereo pairs
- Urban floods: UAVs, hovering/blimp concepts ... these initiatives could be much better connected ... and FAA regulations could be moved forward faster
- Urban in situ sensing may be a better solution (more cost effective ultimately and more accurate) than remote sensing. But satellites at least are democratized ... work anywhere in the world and are not (generally) restricted to local ownership as an in situ network might be.
- Federal gov folks should be coordinated with contract negotiations with commercial satellite providers. Goal is that licensing have coordination between gov agencies for data use and data sharing between agencies, so that data will be provided back for wide use within gov at least if not more publicly for disasters.
- <https://winsar.unavco.org/>. WinSAR consortium is the effective SAR-sharing community portal. The Western North America InSAR (WInSAR) Consortium.
- Another wish: Higher resolution night lights data for population estimation, and natural disaster disruption of power grids and infrastructure

4) What can be expected from this commercial sector in the near future (in relation to floods)?

Group 1:

Group 2:

- building footprints ... and generally asset exposure data
- population estimates (hyper-localized) ... more dynamic/frequently updated