

## [A] Building for FAIR[2] Drone Data

Members of the ESIP Drone Cluster, along with the RDA sUAS Data Interest Group recently published [1], identifying current trends, needs, and resources for academic researchers collecting data using small Unmanned Aircraft Systems (aka Drones).

### Eight community distilled sUAS data management challenges to be addressed

- I. Sensor use procedures
- II. Operational practices
- III. Analytics and Error correction procedures
- IV. Data and metadata data formats
- V. Data and metadata provenance practices
- VI. Data product levels
- VII. Data management and analytics tools
- VIII. Data management education

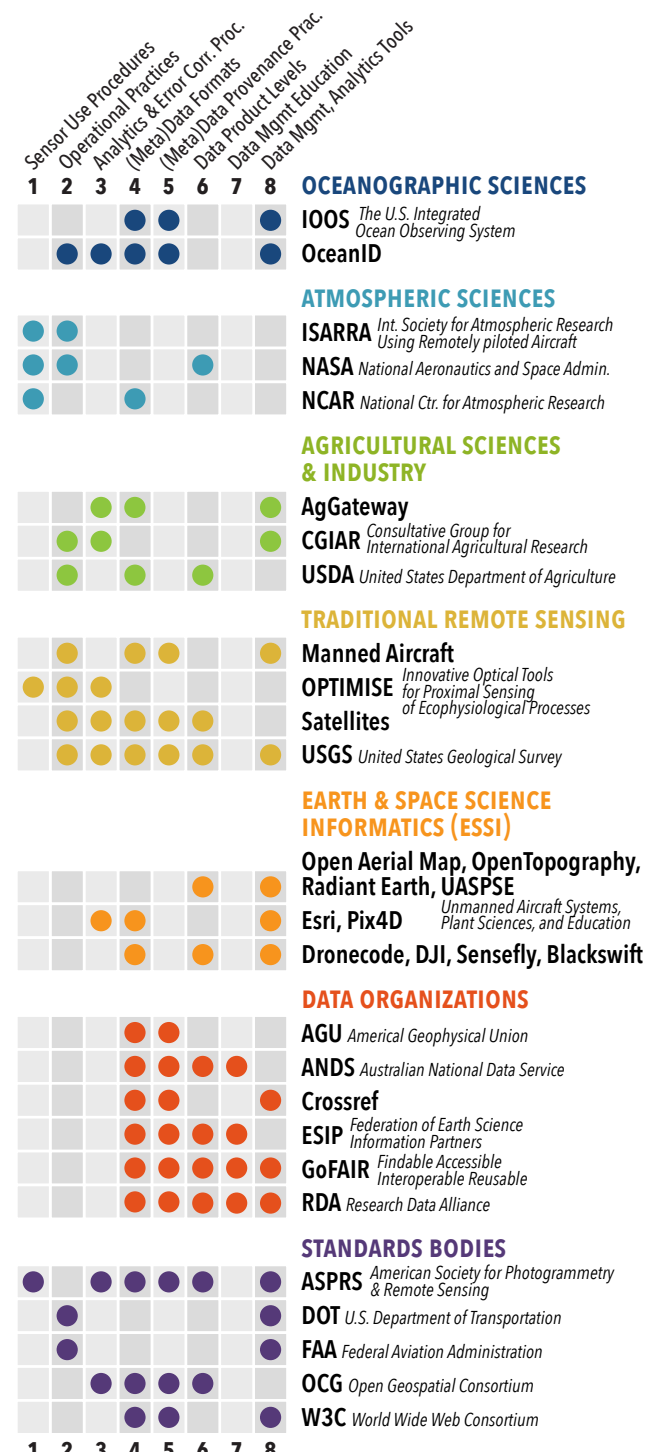


Figure [right]: Key organisations the ESIP Drone cluster and RDA sUAS Data IG engaged with in developing the 8 challenges. [1]

### References

- [1] Wyngaard J et al; 2019; Emergent Challenges for Science sUAS Data Management: Fairness through Community Engagement and Best Practices Development.
- [2] Wilkinson et al; 2016; The FAIR Guiding Principles for scientific data management and stewardship
- [3] By SangyaPundir - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=53414062>



## [B] LANDRS project plan and goals

### Goals

- I] Build everything in community and as open source resources and avoid reinventing wheels
- II] Build a standards based, linked data, and network native APIs for building drone data management infrastructure.
- III] Develop best practices through a 18month Research Data Alliance Working Group engaging with the international drone community.

### Upcoming Hackathons:

- 16 July 2019, Tacoma USA, co-located ESIP Summer meeting
- 21-22 October 2019, Helsinki Finland, co-located Research Data Alliance Plenary 14
- Q3 2020 – Q2 2021: 2 Implementation Hackathons dates and venue TBD (aka pending community input)

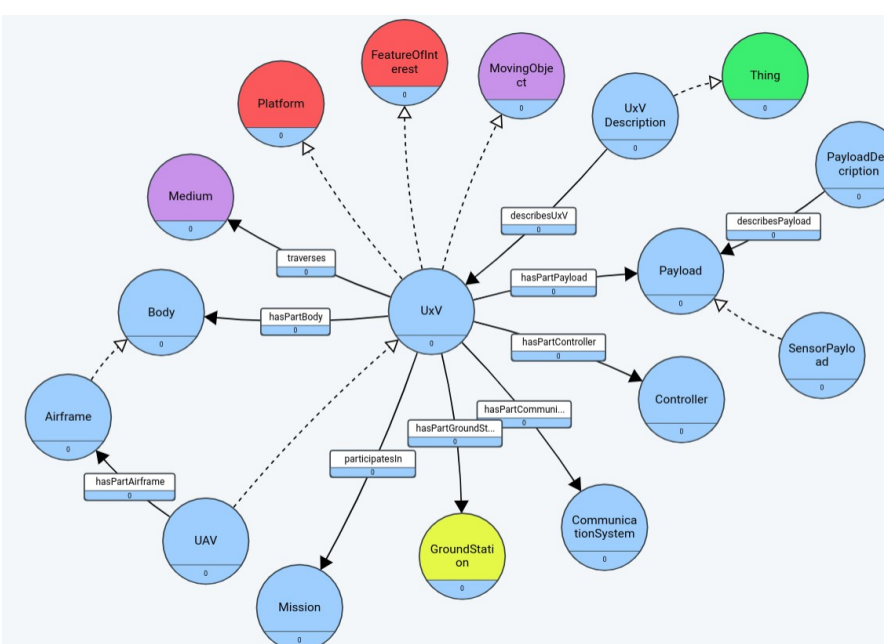
### Upcoming Development:

- Developer supported API implementation
- RDA sUAS Data Working Group: community developed best practices

## [C] Why bother, & why linked drone data

### Why Bother

- I. Drone data is being collected by research groups without dedicated data support
- II. Drone data has huge potential reuse value
- III. A Typical Drone Data Pipeline is very complex (see alongside) in need of automated capture.
- IV. Funders are requiring data publication, and appropriate data adds value to Science [2]



Example UxV knowledge graph

PRE FLIGHT	1. Science Question & Campaign Planning 2. Selection of Platform & Sensors 3. Sensor Integration on Platform 4. Pre-Flight Check & Sensor Calibration
FLIGHT	5. Mission Planning & In Field 6. Flight & Data Collection 7. Download & Stream Data
POST FLIGHT	8. Post Processing 9. Secondary Data Products & Analysis 10. Fusion & Integration 11. Reuse

### Why linked drone data

- Enable discovery by search engine bots
- Enable machine reasoning ("understanding") of the data
- Facilitate reuse by 3<sup>rd</sup> party researchers (by conveying assumptions and meaning of terms through links to term definitions)
- Use of ontologies makes data models modular and reusable/sharable

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This work draws on extensive input over the past 4 years from the broader academic drone user, legislator, manufacturer, and non-drone data management communities



## Linked-data API for Networked DRoneS

## [D] How to get involved

**Github:** <https://github.com/opengeospatial/LANDRS>

**Slack channel:** <https://qr.go.page.link/TcV1W>

**Funded student fellowships:** work with us to implement your drone data application

#Q1 Interested in proposing to build your drone data management application?

#Q2 Interested in hosting/attending a hackathon?

### Get in touch:

Funding for student fellowships and hackathon attendees available, application announcements made on slack channel, ESIP Drone Cluster mailing lists, and RDA sUAS data IG mailing list

ESIP Drone Cluster list: <https://tinyurl.com/yy9bjzhe>

RDA sUAS data IG list: <https://tinyurl.com/z5gf4zr>

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