

# LANDRS

Linked-data **A**PI for **N**etworked **D**Rone**S**



# TOC

- [A] Project and Context
- [B] Design in process
- [C] How to get involved

# [A] PROJECT CONTEXT

## FAIR DRONE DATA?

1. Is making Data FAIR worth while?
  - **Yes:** Says the academic community in general on regarding scientific data within sensible caveats [1–3]

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2. Is making specifically **drone** Data FAIR worth while?

- **Yes:** sUAS data are:
  - Uniquely 4+ dimensional
  - Uniquely high spatiotemporal resolutions
  - Classically Big
  - Increasingly created by small science

# CURRENT CHALLENGES IN DRONE DATA MANAGEMENT[4]

1. Sensor use procedure
2. Operational practices
3. Analytics and Error correction procedures
4. *Data and metadata data formats*
5. *Data and metadata provenance practices*
6. *Data product levels*
7. *Data management and analytics tools*
8. Data management education

# LANDRS PROJECT HIGH LEVEL GOALS

1. A *API, facilitating software stack, and developer community* to enable building drone data management software that will ease drone collected data being made FAIR
2. *Example instantiations* of tools using #1 for specific domains using **#BYO\_Ontology**

# PROJECT TIMELINE

- **2019 Q2 - Q4: Design**
  - ESIP Summer meeting design workshop/hackathon1 *16 July*
  - RDA Helsinki P14 design workshop/hackathon2 *21 October*
  - Begin implementation
  - S.Hemisphere Summer Grad Student Exchange *Oct-Nov*
- **2020 Q1-Q3: Development**
  - Development
  - Deployment hackathon1: Host domain and location TBD\*
  - N.Hemisphere Summer Grad Student Exchange *June-July*
- **2020 Q4 - 2021 Q1: Deployment**
  - Deployment hackathon2: Host domain and location TBD\*
  - Transition to community ownership
  - RDA WG in parallel



[B]DESIGN IN PROGRESS

## CHALLENGES TARGETTED

4. *Data and metadata data formats*
5. *Data and metadata provenance practices*
6. *Data product levels\**
7. *Data management and analytics tools*

## COMPONENTS

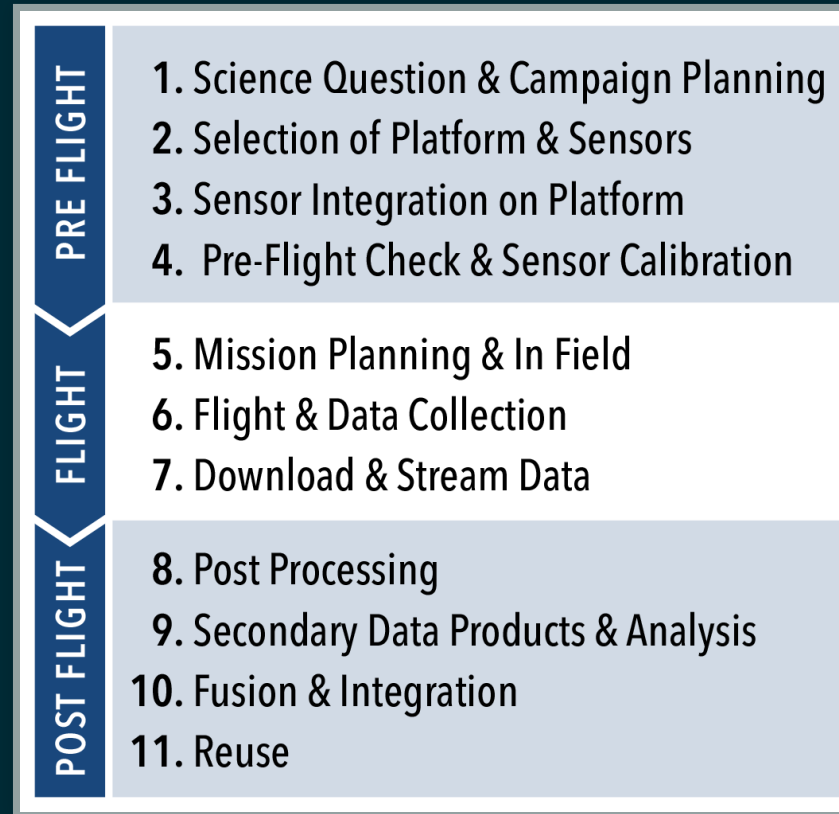
- *Data Semantics:* Ontologies & Models
- *Data Storage:* Files & Schema
- *Data Movement:* Transport & Provenance

\*A task for community discussion and development within a RDA Working Group

## DESIGN METHODOLOGY

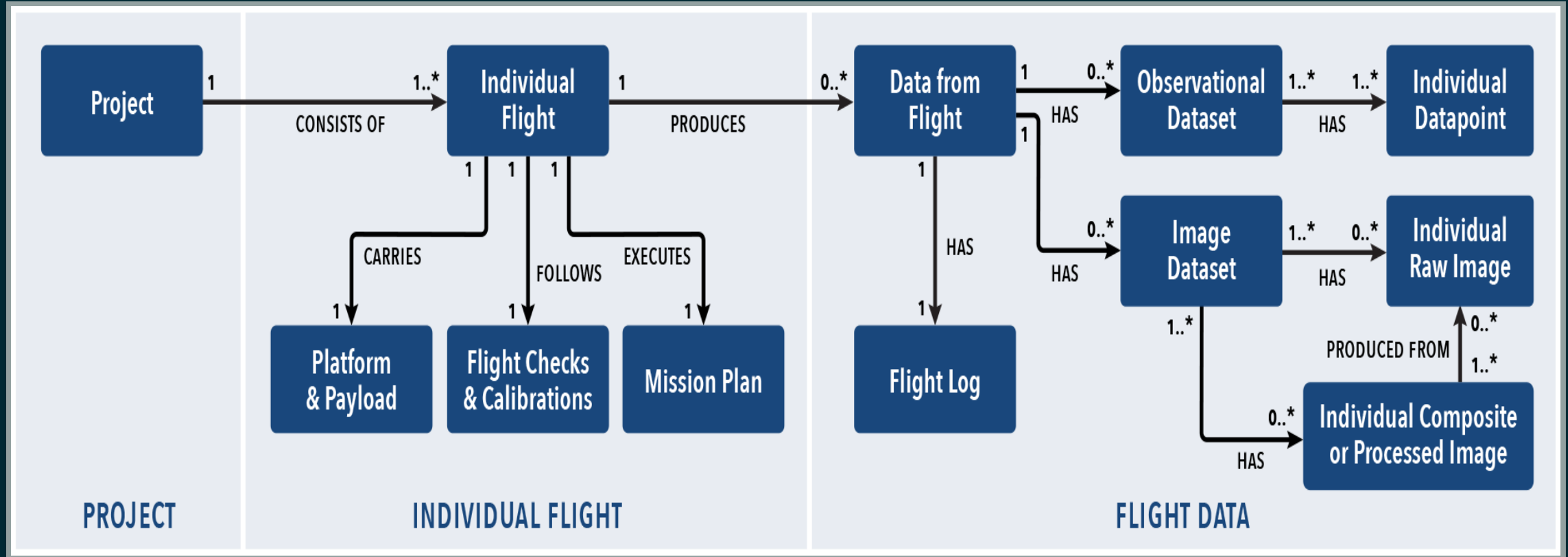
1. Analyse the domain
2. Develop scenarios
3. *Extract competency questions*
4. *Identify existing ontologies for reuse*
5. *Develop the ontology*
6. Validate the new ontology by showing it answers the competency questions

# 1. ANALYSE THE DOMAIN & 2. DEVELOP SCENARIOS



TYPICAL SCIENTIFIC DRONE DATA WORKFLOW

# 1. ANALYSE THE DOMAIN & 2. DEVELOP SCENARIOS



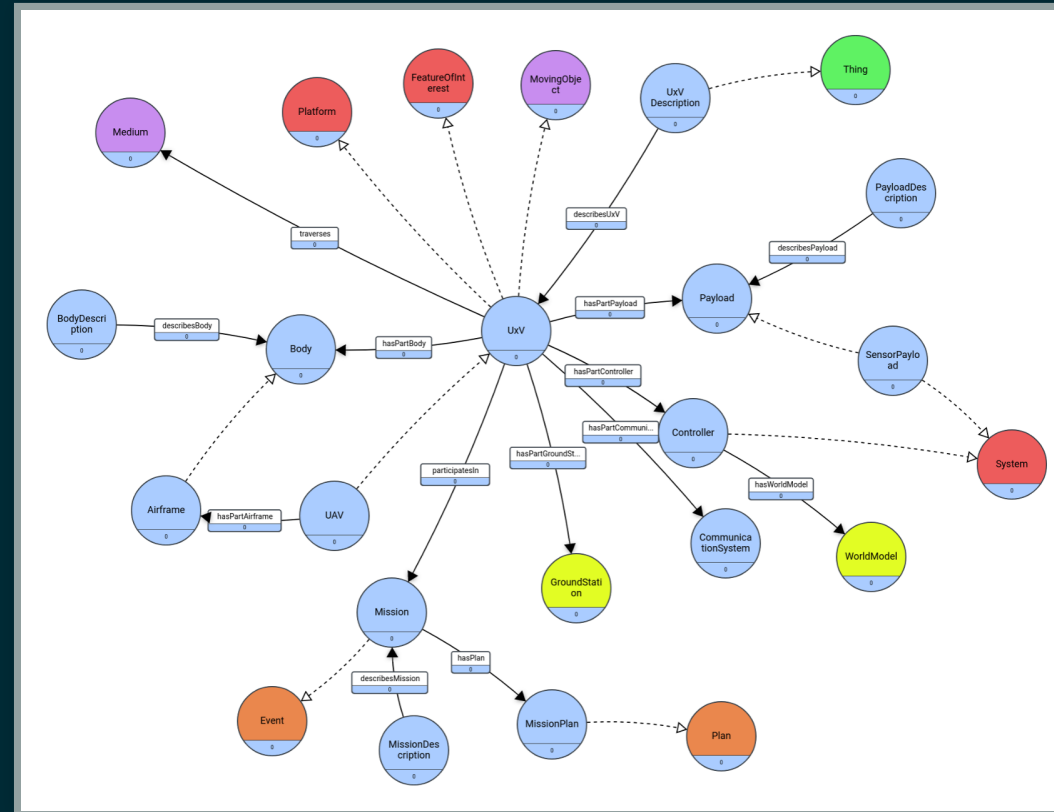
MINIMAL INFORMATION FRAMEWORK [MIF] FOR CREATING FAIR SUAS DATA

### 3. COMPETENCY QUESTIONS?

- **We need to do this.** Eg:
- Questions related to google data search
- Questions related to analytics (local and via search)
- Questions likely asked inflight
- ...

# 4. IDENTIFY EXISTING ONTOLOGIES AND STANDARDS FOR REUSE

- Likely more to be identified\* but we have many already identified:



\*In part a task for community discussion and development within a RDA Working Group

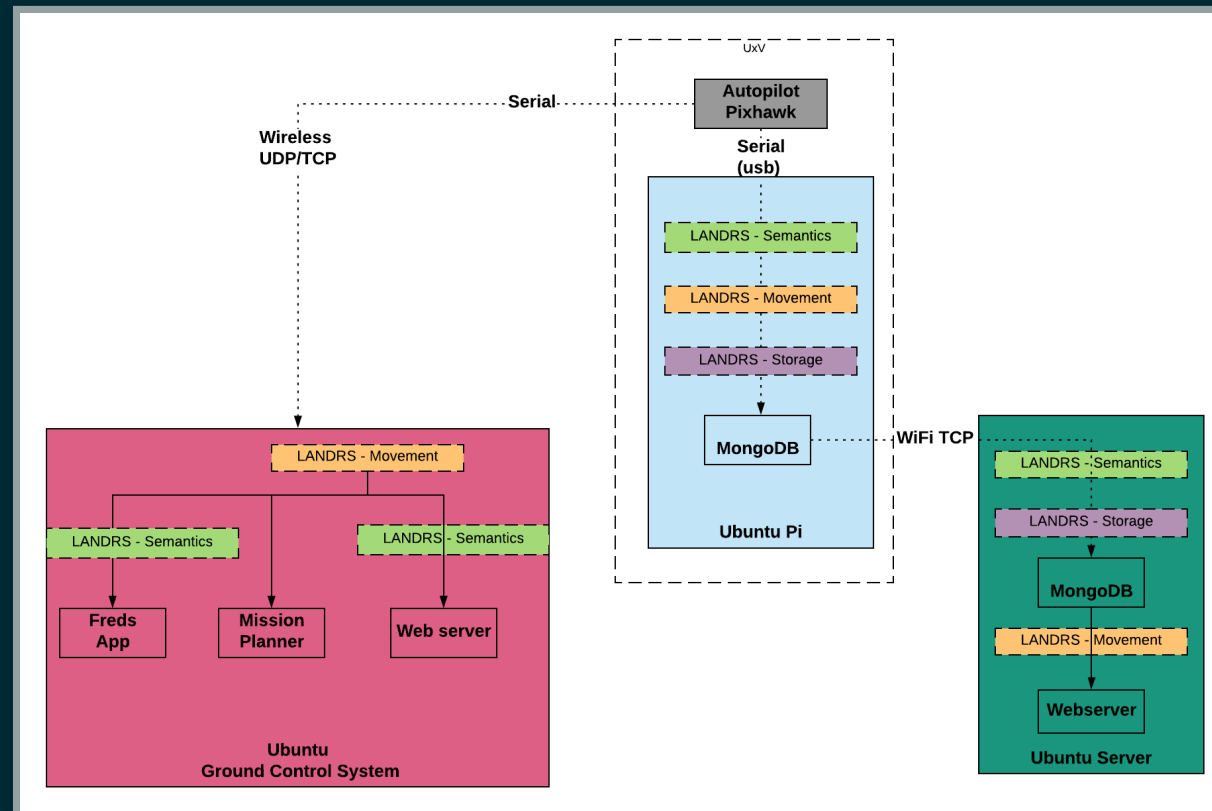
## 5 & 6

5. *Develop the ontology*
6. Validate the new ontology by showing it answers the competency questions



# DUMMY DESIGN IN PROGRESS

- OpenAPI
- AsyncAPI
- CEDARS for schema



## [C] HOW TO GET INVOLVED

- Github here <https://github.com/opengeospatial/LANDRS>
- Slack channel
- **ESIP Design Hackathon1** 15-16 July 2019 Tacoma [ESIP Program, Hackathon agenda](#)
- **RDA Design Hackathon2** 22-23 October 2019 Helsinki Finland - Details and call for participation coming after ESIP. [sUAS Data Interest Group page](#)

## REFERENCES

1. Wilkinson MD, Dumontier M, Aalbersberg IJ, Appleton G, Axton M, Baak A, et al. The fair guiding principles for scientific data management and stewardship. Scientific data. Nature Publishing Group; 2016;3.
2. Stall S, Robinson E, Wyborn L, Yarmey L, Parsons M, Lehnert K, et al. Enabling fair data across the earth and space sciences. Eos. 2017;98.
3. Mons B, Neylon C, Velterop J, Dumontier M, Silva Santos LOB da, Wilkinson MD. Cloudy, increasingly fair; revisiting the fair data guiding principles for the european open science cloud. Information Services & Use. IOS Press; 2017;37: 49–56.
4. Wyngaard J, Barbieri L, Thomer A, Adams J, Sullivan D, Parr C, et al. Emergent challenges for science suas data management: Fairness through community engagement and best practices development. <https://www.preprints.org/manuscript/201905.0274/v1>; Preprints; 2019;