**RDA Interest Group Draft Charter Template**

**Name of Proposed Interest Group:**Small Unmanned Aircraft Systems’ data handling

**Introduction**

Small Unmanned Aircraft Systems (sUAS) are rapidly becoming important tools for data capture across many Scientific domains, as well as within commercial industry. sUAS have the potential to transform how data are captured in many arenas by, offering higher temporal and spatial resolutions, with less impact on the environments being monitored, and access to new locations and parameters. In many cases these advantages are further accompanied by lowered costs and increased human safety during data capture.

As a new technology, however, there are currently no industry-wide accepted best practices for sUAS sensor and flight data handling and management. There are many reasons for why such would be beneficial but 3 of particular note include:

(1) The creation of standards would lower the barrier to entry and innovation in terms of what might be monitored with sUAS, by reducing the number of unknowns a new user faces and providing working examples to serve as guides.

(2) With no common goal standards to build to, the development of mature tools for sUAS captured data processing and fusion (with sUAS and other data sources) is currently hampered. As a consequence, each use case generally develops a unique custom pipeline that only sees one-time use.

(3) sUAS captured data is - for the most part - not being managed according to data stewardship best practices, such as would ensure the data is FAIR, as articulated by Force11 (Findable, Accessible, Interoperable, and Re-usable).

This interest group therefore seeks to explore and publish (via the RDA community based working group model), some best practices as regards the handling of sUAS captured sensor and flight data. By publishing such, after a broad, cross-community engagement process, it is hoped and expected that such will see adoption by both those already using sUAS for scientific work those just beginning to explore their possibilities. They will therefore address the 3 concerns laid out above, with the associated positive consequences for the scientific community. These outcomes also align directly with the RDA’s Vision and Mission focus, namely, promoting the open sharing of data.

**User scenario(s) or use case(s) the IG wishes to address**

There are many examples to list here, the following 3 specific examples are selected solely for the broader context they represent:

(1) It is possible to place a temperature sensor on a sUAS. However, there is currently no other equivalent (spatially or temporally) example of capturing temperature data. It is therefore left to each individual researcher to; create a sampling protocol, to select a data storage format, to determine which of the many possible metadata parameters are worth storing, to develop a tool for processing the captured data for integration with other data sets, and finally to choose how to publish the captured data and with what metadata.

(2) It is currently a non-trivial task (generally one that requires at least team including of members with electrical, computational, and mechanical engineering expertise, along with the target science expertise) to go about using a sUAS to capture data in the field. As a result, there is a new industry evolving that is able to provide many of the desired data products to a researcher for a fee. If standard practices existed these providers would firstly be able to utilise them where advantageous to their own models. Secondly, researchers would be able to require the commercial providers adhere to such, so as to ensure good open data stewardship practices are upheld.

(3) As indicated above it is is currently a non-trivial task to use a sUAS based sensory system. However, in addition to the industry avenue - thanks to the long standing hobbyist Remote Control market - there is already a highly sophisticated and very mature fully open sUAS stack, that is also available to researchers. While already mature in fundamental function this stack is immature in terms of usability and science use case features. It therefore still requires many of the above mentioned expertise to be successfully utilised. However, many of these remaining challenges could be removed or overcome, if the appropriate common standards were in place for developers to build to.

**Objectives:**

1. Provide a venue for data standards and recommendations comparisons with oceanographic AUVs, and other similar platforms.
2. Identify common and divergent data needs across sUAS implementations in different domains.
3. Identify a community aggregation point for others in the field who are currently isolated.
4. Identify community partnerships, including with industry, tech companies/manufacturers, and computing organizations and infrastructures.
5. Provide a venue for ongoing community discussion around the legalities, logistics and opportunities governing sUAS use, given that sUAS are a relatively new data collection platform.

***Participation****:*

Within RDA:

Agricultural Data IG, Geospatial IG, Metadata IG, Marine Data Harmonization, Vocabulary Services IG, Weather Climate and Air Quality IG

External to RDA:

*Earth Science Information Partners (ESIP):* This group will be closely linked with the Earth Science Informatics community through joint development (and continued) collaboration with the Federation of Earth Science Information Partners (ESIP). The Drone Cluster (chaired by Lindsay Barbieri and Jane Wyngaard) provides ample opportunity to work closely with Earth Science data practitioners from NASA, NOAA, USGS, USDA and other major sUAS research organizations. Sessions at biannual meetings and monthly telecons have set the stage for collaborative work and can continue to attract sUAS user interest both from the researcher and data practitioner perspective. Additionally, previous collaborations between the ESIP Drone Cluster and the ESIP Education Workgroup have already resulted in sUAS-use education for K-12 teachers and further workshops for education and implementation activities could be developed.

The following is a list of groups whom Wyngaard and Barbieri have been in contact with, with interest in helping to develop further data and metadata standards and community working relationships:

* *AgGateway:* Consortium of over 300 agricultural industry partners (including sUAS companies) for the development of agricultural industry standards. Barbieri has attended their annual meeting, presented during their geospatial working group session, and has garnered interest and support from their UAS precision agriculture community.
* *UAViators, Humanitarian UAV Network:* With over 2,500 members in 80+ countries they promote the safe, coordinated and effective use of UAVs for data collection and cargo delivery in a wide range of humanitarian and development settings by developing and championing international guidelines for the responsible use of UAVs. Barbieri has connected with Patrick Meier (director), and had him speak at an ESIP meeting and garnered interest for the continued discussion and community development of UAS data standards.
* *The American Geophysical Union (AGU):* Members of the AGU are currently discussing formalizing a UAS Focus Group, or more formalized UAS in Earth Sciences working group. Barbieri has been in communication with them and garnered interest and support for collaboration between AGU Focus Group and an RDA IG.

Other organizations we intend to reach out to, with whom we’ve had some communication and collaborative ties, but no direct explicit RDA IG communication yet:

* OGC, DOT, USGS, W3C, CTEMPS, ASPRS, NOAA

***Outcomes*** *(Discuss what the IG intends to accomplish. Include examples of WG topics or supporting IG-level outputs that might lead to WGs later on.):*

1. Provide a discussion venue for sUAS use within many disciplines to distill current data and metadata uses and needs - with a final report on current practices and identify gaps.
2. Provide a list of recommended data formats for a relevant range of parameters.
3. Provide a list of recommended metadata formats for a range of relevant parameters.
4. Provide a recommended parameter naming convention to be used.
5. Provide a recommended file naming convention to be used.
6. Provide an international and transdisciplinary community platform for continued discussion, development, and implementation of sUAS data recommendations.

***Mechanism*** *(Describe how often your group will meet and how will you maintain momentum between Plenaries.):*

* Regular telecons, potentially subdivided into relevant sections, and as frequent as it relevant for each. For instance, initially there may need to be a weekly telecon for those interested in the broad goal and contributing new insights. This might fade to a monthly telecon. Simultaneously, there may need to be a weekly telecon for those interested in and focused on organising the first kickoff session. Post P9 this may convert into a weekly telecon focused on spinning off a working group.
* Within the USA, the ESIP drone cluster will support bi-annual meetings at meetings in January and July annually. It is hoped that similar equivalent local meetings will develop in Europe and elsewhere.
* The Interest group may potentially support the submission of proposals where the goals of such align with those of this Interest Group.
* Active documentation of IG activity through use of the Open Science Framework, RDA website, or other web-based project management tool, and possible ongoing collaboration through Slack or other online host.

***Timeline*** *(Describe draft milestones and goals for the first 12 months):*

* Hold a kick-off session at P9 in April 2017 that sees contributions from as many relevant sectors as possible (sUAS manufacture and data collection-processing industry, various academic and non-academic current sUAS users, data practice experts, RC hobbiest sUAS community members, and experts from relevant analogous fields).
* Post P9, host continued community discussions to develop a 3 year strategic plan for the sUAS RDA IG, including targeting a specific goal to address via a working group by then end of the first 12 months.
* Conduct a Survey with sUAS users and leaders from a variety of disciplines and sectors to draft a report on current sUAS data and metadata practices and identification of the gap between current practices and ideal data and metadata needs. With the goal of publishing this report and hosting a follow up workshop.

***Potential Group Members*** *(Include proposed chairs/initial leadership and all members who have expressed interest):*

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|  FIRST NAME   |  LAST NAME   |  EMAIL   |  TITLE   |
|  Jane | Wyngaard | jwyngaar@nd.edu | Dr |
| Lindsay | Barbieri | lkbar@uvm.edu  | Miss |
| Colleen |    Strawhacker  | colleen.strawhacker@colorado.edu | Dr  |
| Rob | Stevenson | rdstevenson10@gmail.com  | Dr |
| Cynthia | Parr | cynthia.parr@ars.usda.gov  | Dr |
| Michael | O’Grady | michael.j.ogrady@ucd.ie | Dr |
| Eleni  | Mangina | eleni.mangina@ucd.ie | Dr |
| Kathi | Schleidt  | kathi@datacove.eu> | Dr |
| Karen | Anderson | karen.anderson@exeter.ac.uk | Dr |
| Bill | Teng | bill William.L.Teng@nasa.gov  | Dr |
| Vanessa  | Raymond | vlraymond@alaska.edu | Miss |
| Rodger | Duffett | rodger@csag.uct.ac.za | Mr |
|  |  |  |  |

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