

S1069 Research and Extension for Unmanned Aircraft Systems (UAS) Applications in U.S. Agriculture and Natural Resources

Meeting: Virtual

Date: February 27, 2021

Agenda

8:00 to 8:40 am PST	Meeting overview and remarks by S1069 Administrative Advisor : Dr. Randy Raper Chair: Dr. Alex Thomasson Virtual Host: Dr. Lav Khot
8:40 to 9:30 am	USDA NIFA updates Drs. Steven Thomson & Ganesh Bora
9:30 to 9:40 am	Coffee break
9:40 to 11:30 am	University updates---Objective specific updates by participating members (~5 min each)
11:30 am to 12: 30 pm	Lunch Break
12:30 to 2:30 pm	Discussion/ brainstorming on relevance of this group and pertinent activities to be undertaken in renewed project
2:30 to 2:45 pm	Coffee break
2:45 pm to 4:00 pm	Business meeting

Attendees:

A.-Brice Cazenave
Abhilash Chandel
Aditya Singh
Ajay Sharma
Alex Thomasson
John P Fulton
Dharmendra Saraswat
Gary Allen Thompson
Girish Chowdhary
Glen C Rains
Jim Robbins
Joby Czarnecki
Joshua Jackson
Lav R. Khot
Lee Tarpley
Louis Wasson
Maria Balota
Randy Raper

Robert Austin
Saurav Kumar
Seth C Murray
Scott Powell
Sierra Young
Steven G Hall

Meeting Notes

- Meeting started with brief member introductions
- Dr. Randy Raper and Dr. Gary Thompson then provided brief summary on S1069 group relevance and procedures on renewal, discussed was:
 - Process to request (re) new multistate project
 - Write and review by June 20, 2021 (?); typically takes 6 to 9 months for entire process
 - Review process: draft project (3 to 15 pages), have it peer reviewed, reviewed by the external research committee, two phase process. We can suggest reviewers to the committee for quick process.
 - Writing tips: don't feel constrained by regional aspect, think about what needs to be accomplished by the group, interactions of the group, think where the projects from different people overlap. Don't feel that everyone has to contribute to every objective. Broad objectives to take advantage of large group coming together to solve the big picture.
- Dr. Alex Thomasson provided comments that highlighted difficulty in coordinating multistate project like this and administration of those activities. Stressed need to streamline the objectives and focused achievable activities.
- NIFA NPLs (Drs. Steven Thomson & Ganesh Bora) then provided updates; few take away from the updates were
 - Continued focus on Rural broadband, Urban and indoor farming revitalization, Robotic application in agriculture, Farms of the future
 - Few relevant grant opportunities to think of:
 - A1521: Eng. for Ag production systems
 - A1541: Data science for ag systems
 - NIFA/NSF: National robotics initiative
 - NIFA/NSF: Cyber physical system: real time data analytics
 - NIFA/NSF: signals in the soil
 - AFRI SAS
 - UAS grants in 2020: UGV and UAV collaboration for automated seed refilling in row crops
 - Precision livestock applications with UAS is coming up so do explore this
 - Upcoming solicitations may focus on climate change related calls
 - USDA is seeking collaboration with google, Microsoft, IBM for formulating AG innovation strategy that aligns for new innovation clusters
- University updates

1	Austin State University (David Kulhavy)
2	Mississippi State University (Alex Thomasson, Joby Czarnecki)
3	Ohio State University (John Fulton)
4	Purdue University (Dharmendra Saraswat)
5	State University of New Jersey (Peter Oudemans)
6	University of Arkansas (James Robbins, written report)
7	Virginia Tech (Maria Balota)
8	Washington State University (Lav Khot)
9	University of Georgia (Glen C. Rains)
10	University of Florida (Aditya Singh)
11	TAMU (Saurav Kumar, Seth Murray, Alex Thomasson)
12	University of Kentucky (Joshua Jackson)
13	NCSU (Sierra Young)
14	Cornell University (Lawrence B. Smart, written report)

- Discussion/ brainstorming on relevance of this group (Lead by Dr. Alex Thomasson)

Lav Khot reported on survey of “List your stakeholder, research community needs that S1069 group should focus on” with members adding specific comments that’s reflect as below

UAS platform/sensor specific needs

- In-flight sensor calibration
- Calibration of data
- Field-edge solutions
- Data product transferability/integration with commercial farm management solutions
- Spray drones
- Training on use of technology

Stakeholders

- Plant breeders
- Phenomics researchers (plant biology), Data Scientists
- UAV-based phenotyping
- Cranberry, Blueberry, Tree fruit growers
- Farmers, consultants and other practitioners
- Forest landowners, professional foresters
- Manage vector borne diseases (e.g. Malaria)
- Marine, Animal health

Alex Thomasson stressed the need to have meaningful objectives of the renewed project and with members input following were the drafted objectives

1. Research and develop UAS-based systems and methods for **precise economic and environmental management of inputs and resources** in production of crops, livestock, forests and marine sciences.
2. Research and develop UAS-based remote sensing systems and methods for field **phenotyping & characterization** in crops, livestock, forests and marine sciences.
3. Develop understanding on stakeholder [academic, industry, growers] needs? and **extension education and training resources** on UAS-based monitoring and management technologies.

Members also deliberated writing the renewal project draft and Joby Czarnecki graciously agreed to lead these efforts with help of the members. Below are draft sections to write and assigned folks. Since then Glen C. Reins and Jim Robbins have communicated to help with draft edits.

Objective	Team
Section 2: Statement of Issue(s) and Justification Section 3: Related, Current, and Previous Work	Joby, Seth, Lav, Alex, Glen, Muthu?
Section 4: Objectives	Done, need wordsmithing
Section 5: Methods Section 6: Measurement of Progress and Results	
Section 8: Outreach plan	

- Seth Murray, John Fulton et al., also highlighted need to better assess stakeholder needs and members thought that it would be one of the outcomes of this project; Need to work with sociologist was highlighted during these discussions.

- **Business meeting**

2019-2020 officers

Past Chair: Joby Czarnecki

Chair: Alex Thomasson

Vice Chair: Lav Khot

Secretary: Ganesh Bora (moved to NIFA)

Administrative Advisors: Eric Young/ Randy Raper

NIFA Rep: Steven Thomson

Election of 2021-2022 officers

Past Chair: Alex Thomasson

Chair: Lav Khot

Vice Chair: TBD? (Joby to reach out to John Fulton)

Secretary: Bagavathiannan, Muthukumar (Alex Thomasson to reach out & confirm)

Administrative Advisors: Randy Raper

NIFA Rep: Ganesh Bora

- 2022 meeting: Potentially in person during June-July 2022; hosted by Washington State University (Lav Khot)