NASA/NC Space Grant UAS Team Initiative

AY2016-17 UAS Initiative Team Grants

The emerging unmanned aerial system (UAS) industry is creating new research and employment opportunities in the State of North Carolina, nationally, and globally. Development and use of UAS applies not only to NASA but to military and other public domains, for scientific research, and for applications in the commercial sector. Through the UAS Team Initiative, the NASA/NC Space Grant will support undergraduate teams in hands-on projects to prepare them for engagement in UAS research and application opportunities.

Project Description

NASA/NC Space Grant will fund UAS undergraduate teams to support technical skills development in engineering processes, data collection and communications, and data analytics, as well as marketable real-world skills in teamwork, project management, and communications. Undergraduate student teams shall be composed of students across academic disciplines including but not limited to science, technology, engineering or mathematics (STEM fields). Teamwork may be part of targeted coursework (senior design/capstone projects), regular coursework through engineering and/or science classes, or through a formal club supervised/mentored by a faculty member/instructor. The Initiative will be implemented over the course of the 2016 – 2017 academic year (AY).

For this Initiative, teams may propose technology development, data collection and communications, and/or data analytics projects that address the following sector(s):

1. Infrastructure Inspection (e.g., energy, transportation, structural inspection, etc.)

2. Agricultural/Environmental Monitoring (e.g., precision agriculture, waterways/coastal monitoring, geographical mapping, etc.)

Proposals must clearly define how the NASA/NC Space Grant UAS Team Initiative contributes to technology development and/or research at NASA. In addition, proposals must describe the relevance of the proposed UAS project benefits the State of North Carolina for one or both of the sectors targeted above.

NASA/NC Space Grant anticipates supporting 4 undergraduate student team grants of up to $4,000 each (based on available funding), one (1) of which shall be reserved for a community college team. NASA/NC Space Grant encourages multi-institutional collaborations, in which case each collaborating partner is eligible for up to $4,000 per proposal (in other words up to $4,000 + $4,000 per institution not to exceed $8,000 total). Partnerships, if applicable, must be clearly articulated in the Project Description (see below). Teams shall be responsible for all engineering design modifications, data collection, communication, data analysis and reporting.

Teams may select aircraft currently in use or may purchase new craft. Funds can be used to purchase supplies and materials but not major equipment.

Scope of Work

Teams shall complete a basic operational demonstration, or proof of concept, that they are able to complete or simulate the following:

- Inspect/monitor/assess a defined area of agriculture land (e.g. 1 hectare) or coastline, wetland, or interior land to be determined and described by the proposer (e.g. 2 kilometers); or

- Inspect/monitor/assess an interior or exterior structure or structures(s) or simulated structure, such as a solar field, nuclear facility, water treatment plant, etc.; or

- Inspect/monitor/assess a defined distance of a power or transportation "corridor", e.g., 2 kilometers of roads, railways, powerlines, etc. The distance is to be determined and described by the proposer as appropriate based on the utility or infrastructure.

Deliverables

1. A final report documenting: Process, Data analysis techniques, Data interpretation, Key findings, and Potential real-world applications; and

2. A video demonstrating flight and inspection/monitoring/research capabilities. (The video may be no longer than 10 - 15 minutes.) Documentation of process and teamwork as part of the video is strongly encouraged. The video may be shared using NASA/NC Space Grant social media platforms.

Proposal Guidelines

Teams wishing to be considered must submit a proposal of no more than 5 pages (12 point font). Proposals must contain the following:

1. Cover Page (1 page)

   - Title of the project
   - Faculty PI contact information
   - Total funding amount requested

2. Project Description (3 pages). The description should include sufficient detail that reviewers can evaluate for the appropriateness and feasibility of the proposed plans.

   - A detailed description of how proposed activities will support undergraduate teams in hands-on projects to prepare them for engagement in UAS research and application opportunities;

- A clear set of attainable goals, an outline of the plan of work with milestones and a timeline, and a clear set of metrics (e.g., inputs, outputs, and outcomes). Metrics should reflect NASA/NC Space Grant's Strategic Plan, Goal 2 (Student Engagement): To provide groups of students with opportunities to engage in NASA Mission and STEM-based academic research, competition and coursework, as well as Objectives 2.1, 2.2 and 2.3. For more information about NC Space Grant's Strategic Plan for Goals and Objectives, visit: http://ncspacegrant.org/uploads/images/images/about%20us/2015-2018_Mission%20and%20Strategic%20Plan.pdf;

- Address how the project directly supports and/or contributes to research in one (or more) NASA Mission Directorate (http://www.nasa.gov/open/plan/mission- directorates.html) and/or research and scientific enterprises that contribute to key academic research and/or commercial sectors that benefit the State of North Carolina, e.g., Transportation and Infrastructure, Energy and the Environment, Agriculture, Biotechnology and Life Sciences, Aviation and Aerospace, Nanotechnology, Advanced Manufacturing, etc.);

- A clear description of inter-institutional partnerships if applicable. Each institutional shall submit their own proposal, which must include a description of roles and responsibilities and mechanisms for collaboration and communication.

3. A Budget and Justification (1 page max) not to exceed $4,000 per team, or $4,000 per partner for a collaborative effort (not to exceed $8,000). In the case of a partnership, each institution shall submit their own budget that describes how resources will be utilized in order to avoid resource overlap. Each intuition shall be responsible for a 1:1 cost match;

4. A Letter of Support from the faculty mentor (s) if different from the proposal submitter (PI). This does not count toward the page limit.

Eligibility

- Proposals will be accepted from teams at NASA/NC Space Grant affiliate universities/colleges only.

- Only 1 individual team proposal may be submitted per affiliate. More than one proposal may be submitted in the case that the second proposal is part of a multi-institutional partnership between consortium members, for which institutional partners must submit separate proposals making clear that their efforts shall be collaboratively implemented as part of this Initiative.

- The proposal must be submitted to NASA/NC Space Grant by a faculty member/instructor (PI) and must include a Letter of Support from the NASA/NC Space Grant Campus Director. This letter is not required if the Campus Director is the submitter;

- This opportunity is targeted to undergraduates at NASA/NC Space Grant affiliates. Team members shall be enrolled full-time in undergraduate academic programs (during the 2016-

2017 academic year, starting in either the Fall 2016 or Spring 2017 semester). Community college students may be enrolled part-time;

- Applicants must have an unweighted 3.0 GPA for 4-year institutions and 2.5 GPA for community college students in a STEM or related field.

Period of Performance

The period of performance for this project is the Academic Year October 1, 2016 – May 31, 2017. All final reports, both narrative, financial, and video must be submitted 30 days after the close of the project (est. June 30). Reporting information may be requested throughout the period-of-performance if requested by NASA.

Expectations of Students/Terms of Agreement

- All teams must establish a Google Drive or other online sharing tool for documentation, reports, photos, videos, etc. Access to the drive shall be granted to the NC Space Grant Central Office in order to document lessons learned for future initiatives. Photos and videos may be subject to public sharing via social media unless specifically denoted in a folder labeled as "For Internal Use Only" for institutional propriety issues;

- **Institutions are responsible for adhering to and following all federal (FAA), state, and university/college regulations and policies with regard to aircraft operations, registration, piloted flights, etc., including obtaining necessary permissions, property access, etc.;**

- Projects selected for funding will receive payment through the proposing institution's Office of Sponsored Projects. Equipment purchases and travel expenses are not allowed;

- A 1:1 funding cost-match is required, including for proposals that are submitted as partnerships, i.e., 1:1 cost-match per institution;

- Each team is expected to keep NASA/NC Space Grant informed of their progress. This can include copies of written reports, and/or invitations to sit in on team meetings. A Final Report and video are required as deliverables, and must include student data. NASA/NC Space Grant reserves the right to request student data throughout the award period for reporting needs of the NASA/NC Space Grant Central Office or by NASA;

- NASA/NC Space Grant should be credited in all printed materials, including use NC Space Grant logo;

- A final report on the team project is required electronically (as per above);

- NASA/NC Space Grant shall have access to pictures and videos of team members working on the project for use in reporting to NASA, newsletters, and other publicity unless marked as "For Internal Use Only";

- NASA/NC Space Grant is required by NASA to keep in touch with all awardees of significant programs. If you receive support through this program, expect to keep in touch with NASA/NC Space Grant for some time after the completion of your project (minimum info we'll need is an updated e-mail address so we can contact you if required). Students may access NC Space Grant via LinkedIn Group (https://www.linkedin.com/groups/4242039).

Proposal Submission

Proposals must be submitted via email as a single PDF to Jobi Cook at jobi_cook@ncsu.edu by **September 15, 2016**. Award will be announced by September 30, 2016. Projects selected for funding will receive payments through the proposing institution's Office of Sponsored Projects.

For questions related to this solicitation, please contact Jobi Cook at (919) 515-5933 or jobi_cook@ncsu.edu.