

**Improving Undergraduate STEM
Education: Pathways into the Earth,
Ocean, Polar and Atmospheric &
Geospace Sciences (IUSE:GEOPaths)**

Program Solicitation NSF 20-516

Outline

- **General Context**
 - **Origins & goals of NSF's IUSE initiative**
- **IUSE:GEOPATHs program**
 - **Program goals**
 - **IN, UP & GO tracks**
- **Preparing IUSE:GEOPATHs proposals**

The IUSE Initiative

- **NSF-wide initiative started in FY 2014**
- **Informed by NSTC Committee on STEM Education (CoSTEM)**
5-year strategic framework for federal agencies
- **Responded to PCAST recommendations on STEM education**
- **Designed to address priority investment areas in the NSF undergraduate portfolio**

IUSE Long-Term Goals

- **Improve STEM Learning & Learning Environments**
- **Broaden Participation & Institutional Capacity for STEM Learning**
- **Build the STEM Professional Workforce for Tomorrow**

IUSE Funding Opportunities

- **IUSE: EHR**
 - **EHR Directorate solicitation NSF 19-601**
 - Engaged Student Learning;
 - Institutional & *Community* Transformation
- **IUSE/PFE: Revolutionizing Engineering Departments (RED)**
 - **ENG Directorate solicitation NSF 19-614**
- **RCN: UBE**
 - **BIO Directorate track in solicitation NSF 18-510**
- ***IUSE: GEOPaths***
 - **GEO Directorate solicitation NSF 20-516**

IUSE:GEOPATHs Program Goals

- Increase the number and diversity of students
 - pursuing degrees and careers in the geosciences
- Prepare students for any geoscience career
 - considering **ALL** pathways available to them in the geosciences, including teaching
- Build on & contribute to the evidence base
 - for effective student engagement, learning, and retention in STEM

IUSE: GEOPaths Solicitation FY20 & FY21

NSF 20-516 program solicitation

- LOIs (required)
 - December 20, 2019
 - November 17, 2020
- Full proposals
 - February 14, 2020
 - January 26, 2021

Anticipated funding: \$6,000,000

Budget: Average funding of \$300,000 to \$350,000

Approximately 18 awards (~6 in each track)

IUSE:GEOPATHs - New Tracks

Focus on Geoscience Learning Ecosystems (GLEs)

- **GEOPATHs: Informal Networks (IN)**
- **GEOPATHs: Undergraduate Preparation (UP)**
- **GEOPATHs: Graduate Opportunities (GO)**

Geoscience Learning Ecosystems (GLEs)

GEOPath: Informal Networks (IN)

Collaborative projects in this track will support geoscience learning and experiences in informal settings for teachers, pre-college (e.g., upper level high school) students, and early undergraduates in the geosciences.

Geoscience Learning Ecosystems (GLEs)

GEOPathS: Undergraduate Preparation (UP)

Projects in this track will engage pre-college and undergraduate students in extra-curricular experiences and training in the geosciences with a focus on service learning and workplace skill building.

Similar to GEOPATHS:EXTRA

Geoscience Learning Ecosystems (GLEs)

GEOPATHs: Graduate Opportunities (GO).

Projects in this track will improve research and career-related pathways into the geosciences for undergraduate and graduate students through institutional collaborations with a focus on service learning and workplace skill building.

Similar to GEOPATHS:IMPACT

Eligibility

- **Letters of Intent are required for all tracks.**
- **All eligible organizations identified in NSF Grant Proposal Guide (PAPPG) can collaborate as “non-lead”**
- **PI limits: only 1 proposal per competition if from the sole or lead institution; no limit as non-lead participant**

Eligibility cont.

- ***GEOPATHs-IN***

- Institution must be a U.S. accredited university or 2-year or 4-year college.
- Nonprofit, non-academic organizations located in the U.S. associated with educational or research activities.

- ***GEOPATHs-UP***

- Lead institution must be a U.S. accredited university or 2-year or 4-year college Organization limits: only 1 proposal per competition as sole-submitting or lead institution; no limit as non-lead.
- **“Doctoral Universities: Very High Research Activity” may not serve as the lead institution** and may only submit proposals as the non-lead institution of a collaborative *GEOPATHs:UP* proposal.

- ***GEOPATHs-GO***

- Lead institution must be a U.S. accredited university or 2-year or 4-year college Organization limits: only 1 proposal per competition as sole-submitting or lead institution; no limit as non-lead.

Proposal Preparation (Mechanics)

- **Follow the PAPPG formatting instructions!**
- **Proposal Title MUST indicate the track using this format:**
 - **GEOPaths:IN** projects, the title should read as “**GP-IN:** rest of the title....”
 - **GEOPaths:UP** projects, the title should read as “**GP-UP:** rest of the title....”
 - **GEOPaths:GO** projects, the title should read as “**GP-GO:** rest of the title....”
- **Letters of commitment from partners should be included in the Supporting Documents section.**

Letters of Intent

- **Follow the PAPPG formatting instructions!**
- **Follow solicitation instructions.**
- **LOI purpose:**
 - **Helps determine panelist recruitment**
 - **Signals the correct track has been chosen**
 - **Gives an idea of the project scope**
- **LOIs are not binding (a full proposal scope can be different than what was mentioned in the LOI)!**
- **The Program will comment on appropriate tracks and project concepts *after* the LOI deadline.**

Proposal Preparation (Content)

Project Description should discuss:

- goals, objectives, and metrics of success**
- roles & responsibilities of project personnel**
- how activities scaffold to curriculum**
- demographics and numbers of students impacted by the project**
- diversity & preparation/supervision of mentors**
- metrics & evaluation strategies**
- plans for sustainability post-NSF funding**

Proposal Preparation (Supplementary Documents)

- 1. Postdoctoral Researcher Mentoring Plan**
- 2. Data Management Plan**
- 3. Participant Mentoring Plan (required for all projects that propose activities involving student participants) - up to two pages maximum.**
- 4. Sustainability Plan - up to two pages maximum.**
- 5. Evaluation Plan - up to three pages maximum (including figures).**

Review Criteria

- Intellectual Merit & Broader Impacts
- Additional Review Criteria:
 1. **Participant Recruitment (#6)**
 2. **PI Team:** Does the project team have sufficient experience in supporting students in the types of activities being proposed?
 3. **Organizational Commitment:** Is organizational commitment outlined well in the proposal and is the evidence of support for the project sufficient to achieve the goals and objectives?
 4. **Connection to Research on Geoscience Education:** How well informed are the vision and execution plan by the literature and prior attempts, if applicable, to implement change. Is the expectation of success well-justified?

Additional Review Criteria cont.

5. **Connection to Careers:** Is there a sufficient connection in the proposed project to viable workforce paths in the geosciences?
6. ***Student Recruitment/Mentoring Plan:**
 - a) Is there a mentoring plan in place for student participants?
 - b) Is the recruitment and selection process described with sufficient detail?
 - c) Is the recruitment plan likely to attract a diverse population of students that would benefit from the proposed activities?
 - d) The plan should emphasize strategies to ensure inclusive environments, programming and experiences with a focus on retention and movement of participants to the next appropriate level of education and research acumen (including but not limited to sufficient training for faculty and staff to successfully undertake their roles as mentors and supervisors of the student participants).
7. ***Project Evaluation and Reporting:** Will the evaluation and monitoring plan provide sufficient documentation that project goals and outcomes have been realized?
8. ***Potential for Sustainability:** What is the potential for sustaining project activities and/or institutional collaborations after funding ends?

Caveats

IUSE: GEOPATHs proposals should not duplicate activities that can be achieved through:

- **IUSE: EHR program**
- **Research Experiences for Undergraduates (REU) Sites or Supplements program**
- **Advanced Technological Education (ATE) program**
- **Tribal Colleges and Universities Program (TCUP) *P*artnerships for *GE*oscience (*PAGE*) track, the HBCU-UP Program and the Hispanic Serving Institution (HSI) Program.**

Caveat about Geospatial Methods

- GIS/GPS and remote sensing are common tools used within the geosciences professional community, but...
- NSF has a separate Geography program in the SBE directorate, so **GEO funds are used to support a minimal amount of training in GIS/GPS/remote sensing, focusing on efforts that are intrinsically tied to scientific content related to the geosciences (e.g., using these tools to investigate geoscience research questions)**

If you still have questions.....

Send email to geopaths@nsf.gov or contact one of the following program officers:

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For more information about the IUSE:EHR program, contact:

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