

**NASA Open Source Tools, Frameworks, and Libraries 2020**  
**PROPOSAL SUBMITTED IN RESPONSE TO NRA: NNH20ZDA001N-OSTFL**  
**PANEL EVALUATION**

**Proposal Number:** 20-OSTFL20-0023

**PI Name:** Delene, David

**PI Institution:** University of North Dakota

**Proposal Title:** Sustainable Software for Processing Airborne Data to Support the Workflow of Atmospheric Science Researchers

**PROPOSAL SUMMARY**

This proposal aimed to enhance the Airborne Data Processing and Analysis software framework to better support handling large observational data sets. First released in 2007 with components that have been under continuous development for 20 years, ADPAA has supported at least six named NASA field projects and is available as open-source. The objectives of the proposed work include

- To move the code from IDL to Python to enable use by those without IDL,
- To refactor the code to improve its understandability, and
- To document the data processing workflow.

The expected result would be more sustainable software in part due to the popularity of Python.

**Merit**

**STRENGTHS:**

The proposal's authors demonstrated a strong understanding of the problems that the lack of open-source software poses to science, e.g., reproducibility, peer review, etc., and the impediments to releasing more open-source.

The team PI has a strong record of leading the development of the software involved and is thus best positioned to perform the proposed work.

Ongoing student involvement in contributing to a departmental wiki would benefit the documentation effort.

**WEAKNESSES:**

**The P.I. and Co-I do not indicate whether they have any experience in the wider open-source development community as leaders or contributors.** The GitHub repository presented as exemplary is not developed by the PI or Co-I. It appears they have experience with open-source

development on SourceForge in teaching. The proposal did not describe parts of the development well such as what is needed for interoperability to be implemented.

The proposal described the gateway but not what enhancements and why they were making them.

**Merit Rating:**

Excellent	Very Good / Good	<input type="checkbox"/> Fair
Excellent / Very Good	✓ Good	<input type="checkbox"/> Fair / Poor
Very Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Poor

**Relevance**

**STRENGTHS:**

The proposal's goal to translate the software to Python would likely increase the software's sustainability considerably by increasing the likelihood of code contributions from the scientific community. The code's long history of continued development and use in six named projects aligns with the solicitations objective to fund open-source software that has significant usage in the NASA science community.

**WEAKNESSES:**

The breadth of coverage of SMD science is not explained.

**Relevance Rating:**

Excellent	✓ Very Good / Good	<input type="checkbox"/> Fair
<input type="checkbox"/> Excellent / Very Good	<input type="checkbox"/> Good	<input type="checkbox"/> Fair / Poor
Very Good	Good / Fair	<input type="checkbox"/> Poor

**Cost**

**STRENGTHS:**

The amount of time that the PI and postdoc will devote to the effort shows a strong commitment: 3 months/year for 3 years for the PI and 12 months/year for 3 years for the postdoc.

**WEAKNESSES:**

**The amount of work involved in translating 200,000 lines of code to a new language is likely higher than is feasible in the proposed amount of time.** The project would have benefitted

from initial prototyping for proof of concept to justify the feasibility of translating such an extensive codebase into another language within the budgeted labor hours.

**Cost Rating:**

Excellent	Very Good / Good	<input type="checkbox"/> Fair
<input type="checkbox"/> Excellent / Very Good	Good	<input type="checkbox"/> Fair / Poor
Very Good	✓ Good / Fair	<input type="checkbox"/> Poor

**OVERALL PROPOSAL RATING:**

Excellent	Very Good / Good	<input type="checkbox"/> Fair
Excellent / Very Good	✓ Good	<input type="checkbox"/> Fair / Poor
Very Good	<input type="checkbox"/> Good / Fair	<input type="checkbox"/> Poor

**COMMENTS OR SUGGESTIONS FOR THE PROPOSER (OPTIONAL)**

The GPL license can be a poison pill for some large organizations, e.g., some companies. You might consider a more permissive license such as the BSD license to ease adoption.