



National  
Aeronautics and  
Space  
Administration

# Disclosure of Invention and New Technology (Including Software)

Form Approved  
O.M.B. NO.  
2700-0009

DATE  
2014-11-21

CONTRACTOR CASE NO.

This is an important legal document. Carefully complete and forward to the Patent Representative (NASA in-house innovation) or New Technology Representative (contractor/grantee innovation) at NASA. Use of this report form by contractor/grantee is optional; however, an alternative format must at a minimum contain the information required herein. NASA in-house disclosures should be read, understood and signed by a technically competent witness in the witness signature block at the end of this form. In completing each section, use whatever detail deemed appropriate for a "full and complete disclosure." Contractors/Grantees please refer to the New Technology or Patent Rights – Retention by the Contractor clauses. When necessary, attach additional documentation to provide a full, detailed description.

NASA CASE NO. (OFFICIAL USE ONLY)  
LAR-18583-1

## 1. DESCRIPTIVE TITLE

DEVELOP National Program Python Package

## 2. INNOVATOR(S) (For each innovator provide: Name, Title, Work Address, Work Phone Number, and Work E-mail Address. If multiple innovators, number each to match Box 5.)

Jeffry Ely 10210 Greenbelt Road, Lanham, MD 20706, US, 757-218-1673 Jeff.ely.08@gmail.com  
Lauren Makely 10210 Greenbelt Road, Lanham, MD 20706, US, 757-897-8932 lmakely09@gmail.com

## 3. INNOVATOR'S EMPLOYER WHEN INNOVATION WAS MADE (For each innovator provide: Name, Division and Address of Employer, Organizational Code/Mail Code, and Contract/Grant Number if applicable. If multiple innovators, number each to match Box 5.)

Science Systems And Applications, Inc., , 10210 Greenbelt Road, Lanham, MD 20706, US, , NNL11AA00B  
Science Systems And Applications, Inc., , 10210 Greenbelt Road, Lanham, MD 20706, US, , NNL11AA00B

## 4. PLACE OF PERFORMANCE (Address(es) where innovation made)

10210 Greenbelt Road, Lanham, MD 20706, US  
10210 Greenbelt Road, Lanham, MD 20706, US

## 5. EMPLOYER STATUS (choose one for each innovator)

\_\_\_\_\_  
Innovator #1                      Innovator #2

\_\_\_\_\_  
Innovator #3                      Innovator #4

GE = Government  
CU = College or University  
NP = Non-Profit Organization  
SB = Small Business Firm  
LE = Large Entity

## 6. ORIGIN (Check all that apply and provide all applicable numbers. If multiple Contracts/Grants, etc., list Contract/Grant Numbers in Box 3 with applicable employer information.)

- ☐ NASA In-house Org. Mail Code  
☐ Grant/Cooperative Agreement No.  
☐ Prime Contract No.  
Task No. Report No.  
☐ Subcontractor: Subcontract Tier  
☐ Joint Effort (contract, subcontractor and/or grantee contributions(s), and NASA in-house contribution)  
☐ Multiple Effort (multiple contractor, subcontractor and/or grantee contributions, no NASA in-house contribution)  
☐ Other (e.g., Space Act Agreement, MOA) No.

## 7. NASA CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR)

## 8. CONTRACTOR/GRANTEE NEW TECHNOLOGY REPRESENTATIVE (POC)

## 9. BRIEF ABSTRACT (A general description of the innovation which describes its capabilities, but does not reveal details that would enable duplication or imitation of the innovation.)

The DEVELOP National Program Python Package creates a python programming environment for simple processing of large NASA data sets to prepare them for further analysis in an ESRI ArcMap environment. It includes an instructional framework to guide users who are new to performing GIS tasks in a heavily code based python environment.

SECTION I – DESCRIPTION OF THE PROBLEM OR OBJECTIVE THAT MOTIVATED THE INNOVATION’S DEVELOPMENT (Enter as appropriate: A. – General description of problem/objective; B. – Key or unique problem characteristics; C. – Prior art, i.e., prior techniques, methods, materials, or devices performing function of the innovation, or previous means for performing function of software; and D. – Disadvantages or limitation of prior art.)

Teams in the DEVELOP program increasingly find themselves using some level of programming to manipulate data. Much of the time, this manipulation is performed in Python. The DEVLEOP Python package, referred to as dnppy is being created to improve institutional knowledge retention, open the DEVELOP toolkit for public contributions and use, and represent DEVLEOP in the public domain. It is a joint social media and programming capacity building endeavor.

Prior techniques involved creation of very customized scripts that served to process initial data, but did not result in a code base that could be flexibly used by a third party. This resulted in many core functions being re-invented by different teams with different levels of programming experience, and with novice programmers struggling to make legacy code work in their custom environment. The dnppy package aims to improve programming education, coded capability retention, and code quality.

SECTION II – TECHNICALLY COMPLETE AND EASILY UNDERSTANDABLE DESCRIPTION OF INNOVATION DEVELOPED TO SOLVE THE PROBLEM OR MEET THE OBJECTIVE (Enter as appropriate; existing reports, if available, may form a part of the disclosure, and reference thereto can be made to complete this description: A. – Purpose and description of innovation/software; B. – Identification of component parts or steps, and explanation of mode of operation of innovation/software preferably referring to drawings, sketches, photographs, graphs, flow charts, and/or parts or ingredient lists illustrating the components; C. – Functional operation; D. – Alternate embodiments of the innovation/software; E. – Supportive theory; F. – Engineering specifications; G. – Peripheral equipment; and H. – Maintenance, reliability, safety factors.)

Many core functions for the most general data processing have already been added. Instructional templates to guide new programmers to effectively structure code in a GIS context with demonstrations have been added. Protocols for adding new functionality to the package after it enters the public domain have been established.

SECTION III – UNIQUE OR NOVEL FEATURES OF THE INNOVATION AND THE RESULTS OR BENEFITS OF ITS APPLICATION (Enter as appropriate: A. – Novel or unique features; B. – Advantages of innovation/software; C. – Development or new conceptual problems; D. – Test data and source of error; E. – Analysis of capabilities; and F. – For software, any re-use or re-engineering of existing code, use of shareware, or use of code owned by a non-federal entity.)

SECTION IV – SPECULATION REGARDING POTENTIAL COMMERCIAL APPLICATIONS AND POINTS OF CONTACT (Including names of companies producing or using similar products.)

10. ADDITIONAL DOCUMENTATION <i>(Include copies or list below any pertinent documentation which aids in the understanding or application of the innovation (e.g., articles, contractor reports, engineering specs, assembly/manufacturing drawings, parts or ingredients list, operating manuals, test data, assembly/manufacturing procedures, etc.).)</i>			
TITLE	PAGE	DATE	
11. DEGREE OF TECHNOLOGY SIGNIFICANCE <i>(Which best expresses the degree of technological significance of this innovation?)</i> <input checked="" type="checkbox"/> Modification to Existing Technology <input type="checkbox"/> Substantial Advancement in the Art <input type="checkbox"/> Major Breakthrough			
12. STATE OF DEVELOPMENT <input type="checkbox"/> Concept Only <input type="checkbox"/> Design <input type="checkbox"/> Prototype <input type="checkbox"/> Modification <input type="checkbox"/> Production Model <input checked="" type="checkbox"/> Used in Current Work			
13. PATENT STATUS <i>(Prior patent on/or related to this innovation)</i>			
14. INDICATE THE DATE OR THE APPROXIMATE TIME PERIOD WHICH THIS INNOVATION WAS DEVELOPED <i>(i.e., conceived, constructed, tested, etc.)</i>			
15. PREVIOUS OR CONTEMPLATED PUBLICATION OR PUBLIC DISCLOSURE INCLUDING DATES <i>(Provide as applicable: A. - Type of publication or disclosure, e.g. report, conference or seminar, oral presentation; B. - Disclosure by NASA or Contractor/Grantee; and C. - Title, volume no., page no., and date of publication)</i>			
16. QUESTIONS FOR SOFTWARE ONLY			
(a) Using non-NASA employees to beta-test the program? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO    If Yes, done under a beta-test agreement? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (b) Modification of this program continued by civil servant and/or contractual agreement? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (c) Copyrighted registered? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN    If Yes, then by whom? (d) Has the latest version been distributed outside of NASA or contractor? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN (e) Were prior version distributed outside of NASA or Contractor? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN    If Yes, supply NASA or contractor contact (f) Contains or based on code not owned by U.S. Government or its contractors? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN If Yes, name of code and code's owner Has a license for use been obtained? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN			
17. DEVELOPMENT HISTORY			
STAGE OF DEVELOPMENT	DATE (MM/YYYY)	LOCATION	IDENTIFY SUPPORTING WITNESSES NASA in-house only)
a. First disclosure to others	0/		
b. First sketch, drawing, logic chart or code	0/		
c. First written description	0/		
d. Completion of first model of full size device <i>(invention)</i> or beta version <i>(Software)</i>	0/		
e. First successful operational test <i>(invention)</i> or alpha version <i>(Software)</i>	0/		
f. Contribution of innovators <i>(if jointly developed, provide the contribution of each innovator)</i>			
g. Indicate any past, present, or contemplated government use of the innovation			
18. SIGNATURES OF INNOVATOR(S), WITNESS(ES), AND NASA APPROVAL			
TYPED NAME AND SIGNATURE <i>(Innovator #1)</i>	DATE	TYPED NAME AND SIGNATURE <i>(Innovator #2)</i>	DATE
TYPED NAME AND SIGNATURE <i>(Innovator #3)</i>	DATE	TYPED NAME AND SIGNATURE <i>(Innovator #4)</i>	DATE
TYPED NAME AND SIGNATURE <i>(Innovator #5)</i>	DATE	TYPED NAME AND SIGNATURE <i>(Innovator #6)</i>	DATE
NASA APPROVED	TYPED NAME	SIGNATURE	DATE