Assessment Information

CoreTrustSeal Requirements 2017–2019

Repository:	WDC - NSIDC
Website:	http://nsidc.org/
Certification Date:	24 March 2020
This repository is owned by:	National Snow and Ice Data Center, University of Colorado

Core Trustworthy Data Repository Requirements

BACKGROUND INFORMATION

Context

R0. Please provide context for your repository.

Repository Type.

Domain or subject-based repository

Reviewer 1:

Accept

Reviewer 2:

Accept

Comments

Brief Description of the Repository's Designated Community.

NSIDC supports earth science user communities, predominately conducting cryospheric and climate research related to sea ice, terrestrial snow, glaciers, ice sheets, ice shelves, and permafrost.

Reviewer 1:

Accept

Reviewer 2:

Accept

Level of Curation Performed.

A. Content distributed as deposited

B. Basic curation – e.g. brief checking; addition of basic metadata or documentation

C. Enhanced curation – e.g. conversion to new formats; enhancement of documentation

D. Data-level curation – as in C above; but with additional editing of deposited data for accuracy

Reviewer 1:

Accept

Reviewer 2:

Accept

Comments

For the few data sets modified to increase data set usability (i.e. data formats, metadata), the raw data provided to NSIDC by the data producer are preserved in the NSIDC archive. The edited data are publicly distributed.

NSIDC follows the guidelines established by the agencies sponsoring data stewardship programs at NSIDC. Refer to R3 for additional information related to these guidelines. In addition, the level of curation performed is also influenced by the data set Levels of Service (LoS) model. The LoS tiers distinguish the level of data review, documentation creation, and user support that the NSIDC DAAC provides for an individual data set. Refer to https://nsidc.org/sites/nsidc.org/files/files/NSIDCLevelsOfService-V3_0.pdf

Reviewer 1:

Accept

Reviewer 2:

Accept

Outsource Partners. If applicable, please list them.

Other Relevant Information.

ORGANIZATIONAL INFRASTRUCTURE

I. Mission/Scope

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R1. The repository has an explicit mission to provide access to and preserve data in its domain.

NSIDC will make fundamental contributions to cryospheric science and will excel in managing data and disseminating information in order to advance understanding of the Earth's frozen regions. NSIDC works to ensure that past, present, and future science data remain accessible for studying the Earth and its climate. Refer to https://nsidc.org/about/overview and https://nsidc.org/about/history.html

Data producers/depositors: NASA, NOAA, NSF-funded investigators

User communities: Cryospheric scientists, polar researchers, climate scientists, indigenous communities, policy makers and the public

Reviewer 1:

Accept

Reviewer 2:

Accept

II. Licenses

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R2. The repository maintains all applicable licenses covering data access and use and monitors compliance.

NSIDC conforms to the U.S. Federal Government Policy on free and open access to scientific data for nearly all of the 1,000 data sets being distributed. There are no conditions imposed on users in the use of these data. NSIDC works with data providers on data curation activities to ensure that data are documented and preserved with the distribution package, and are appropriately credited to the authors of the data. As a condition of use, users are asked to cite the use of our data with a formal data citation. A citation acknowledges our data contributors, Refer to https://nsidc.org/about/use_copyright.html.

Two data sets from the Exchange for Local Observations and Knowledge of the Arctic (ELOKA) are sensitive and not necessarily open. ELOKA works to promote knowledge coproduction bringing indigenous communities and scientists together in support of climate data.

The ELOKA program does not hold licensing agreements related to the sensitive data. Rather, access to these data is permitted to users approved by partnered indigenous communities through the Alaska Arctic Observation and Knowledge Hub (AAOKH). A Use Agreement is required as part of the approval process. Refer to https://eloka-arctic.org/sizonet/ to see an example.

Refer to the Local Observations and Knowledge: Data Management Issues and Practices https://eloka-arctic.org/about/manual/index.html. Refer to R2 License, R12 Workflows

Reviewer 1:

Accept

Reviewer 2:

Accept

III. Continuity of access

Compliance Level: 3

Reviewer 1:

3

Reviewer 2:

3

R3. The repository has a continuity plan to ensure ongoing access to and preservation of its holdings.

Long-term preservation of data at NSIDC is assured by the agencies sponsoring the data stewardship programs located at NSIDC, specifically NASA, NOAA, and NSF. Ongoing data access at NSIDC is dependent upon continued funding by the sponsors. If program sponsorship ends, NSIDC will work with the sponsor to negotiate terms of continued archival through transition or dispersion to another sponsor-funded data repository. Specific long term preservation policies for data at NSIDC may differ according to the sponsoring agency.

Related references include, but are not limited to:

The NOAA program at NSIDC is governed by the NAO 212-15: Management of Environmental Data and Information which is available at https://nosc.noaa.gov/EDMC/nao_212-15.php.

The NASA DAAC at NSIDC is governed by the "Requirements for Archiving, Distribution and User Services in EOS Data and Information System (EOSDIS)" available at https://cdn.earthdata.nasa.gov/conduit/upload/6355/423-10-69_ADURD_RevB.docx. This document states: Requirements to archive and distribute the data for a given mission extend as long as required by the ESDIS Project. The ESDIS Project will work with the DAACs to ensure the long-term preservation of the DAAC archive collection.

Reviewer 1:

Accept. It is expected by the time of your next certification that evidence can be provided of a negotiated solution guaranteeing continued data access.

Reviewer 2:

Accept

IV. Confidentiality/Ethics

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R4. The repository ensures, to the extent possible, that data are created, curated, accessed, and used in compliance with disciplinary and ethical norms.

The majority of NSIDC data holdings (all but two data sets) currently distributed do not require disclosure of risk. These data are free and open to the public. Personal and/or sensitive information collected by NSIDC staff or systems in support of the data collections are not shared or published.

ELOKA data open to the public reside on the NSIDC Data Management System. The two sensitive ELOKA data sets reside on private NSIDC servers, outside of NSIDC's primary Data Management Systems. These data are accessible through ELOKA-developed portals, outside of the NSIDC web domain. For the two data sets considered sensitive, access is permitted to users approved by partnered indigenous communities.

Refer to R2 License, R12 Workflows

Reviewer 1:

Accept

Reviewer 2:

Accept

V. Organizational infrastructure

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R5. The repository has adequate funding and sufficient numbers of qualified staff managed through a clear system of governance to effectively carry out the mission.

NSIDC has an annual budget of roughly US$16 million per year. This is provided through various grants and contracts ranging in duration from one to five years. NSIDC is also supported by the Cooperative Institute for Research in Environmental Sciences and the University of Colorado.

The NASA DAAC at NSIDC was established in 1993 and is funded through five year contracts with the NASA GSFC Earth Science Data and Information Systems (ESDIS) Project.

NSF funded programs began in 1999 and are typically funded through five year grants through the Office of Polar Programs.

NOAA@NSIDC was established in 2000 and is affiliated with the NOAA National Centers for Environmental Information (NCEI) through the CIRES cooperative agreement with NOAA. NOAA@NSIDC activities are included as tasks within the cooperative agreement, and are funded through one year funding increments with NOAA/NESDIS/NCEI.

NSIDC employs roughly 100 professional and student employees with broad skillsets and averaging more than 10 years' experience within the organization to effectively support the NSIDC mission (refer to R0 Context). Staff include a Director, financial officer, human resources, program managers, supervisors, data management coordinators, system engineers and administrators, data operations, developers, technical writers, web/communications specialists, user support specialists and scientific researchers in earth, social and informatics research. Refer to https://nsidc.org/about/people.html.

Reviewer 1:

Accept

Reviewer 2:

Accept

VI. Expert guidance

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R6. The repository adopts mechanism(s) to secure ongoing expert guidance and feedback (either in-house, or external, including scientific guidance, if relevant).

Administrative guidance from NSIDC sponsors occurs through routine agency reporting procedures.

NSIDC has a responsive, professional User Services Office (USO) and press officer who directly interact with the user community. The staff are skilled in communication, earth science and geospatial data to better support, advocate and articulate user's needs with data selection and usage of the data. Refer to https://nsidc.org/data/support.

NSIDC has responsive and interactive scientific researchers that inform NSIDC data management programs of the growing cryospheric community needs. NSIDC also leverages the NSIDC NASA DAAC's User Working Group (an external advisory committee). Their guidance regarding data holdings, system capabilities, documentation and data formats resonates across NSIDC programs.

Reviewer 1:

Accept

Reviewer 2:

Accept

DIGITAL OBJECT MANAGEMENT

VII. Data integrity and authenticity

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R7. The repository guarantees the integrity and authenticity of the data.

All data provided to NSIDC for archival and distribution comes from data producers funded and/or vetted by the agency sponsoring the data management programs at NSIDC. For example, data submitted to the NASA DAAC at NSIDC must come from an assigned NASA mission or been approved through the DAAC Data Accession Plan.

NSIDC employs two data management systems for the inventory and archival of data. Both systems utlize checksums (cksum, md5) to ensure data file integrity. For data maintained in the general NSIDC data management system, manual verification of checksums are performed and retained in a database which is used to perform fixity checks every 90 days. The NASA DAAC EOSDIS Core System (ECS) operates to perform ingest, archival and distribution, and verifies checksums provided by the data producer after data transfer prior to ingest. The ECS system also includes data verification utilities which are ran against the data holdings to perform fixity checks every 90 days. Checksums are provided in the metadata to data users to enable user verification of data integrity.

NSIDC follows a data versioning strategy which organizes and documents major and minor data set versions. Metadata records, data set documentation and DOIs are maintained within a database for each major version of a data set, as shown on a data set landing page https://nsidc.org/data/g02202/versions/3. Differences between the versions are documented in a Version Summary on the landing page and within the data set documentation. The retention policy for older versions of data are negotiated with the associated program and funding agency. In most cases, NSIDC maintains the previous versions of data in the archive. Metadata and documentation are also maintained for past versions of data sets and are linked to the most recent version, refer to https://nsidc.org/data/g02202/versions/2.

Reviewer 1:

Accept

Reviewer 2:

Accept

VIII. Appraisal

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R8. The repository accepts data and metadata based on defined criteria to ensure relevance and understandability for data users.

Data become the responsibility of NSIDC through a variety of official program agreements, formal and informal PI relationships or data rescue projects. Data can be both solicited and tendered, can arrive with or without funding for publication and archival, and can have various degrees of value to current and future user communities.

New additions to the NSIDC data catalog begin with identifying the data to be added and source of funding, followed by appraisal and acquisition phases. Each program within NSIDC has defined accession criteria in accordance with contractual requirements. Each program has data management teams responsible for the varying data collections archived and distributed at NSIDC (e.g. DAAC SMAP team, NOAA@NSIDC team, NSF AGDC team). These teams examine the data files for quality and usability, and curate the metadata for provenance and discovery. The level of curation, including the elements of the curated metadata is determined by the identified Levels of Service (Los) for the data set, refer to https://nsidc.org/about/policies and https://nsidc.org/sites/nsidc.org/files/files/NSIDCLevelsOfService-V3_0.pdf.

The teams also recommend to data providers the use of approved standards, such as data formats to ensure data are well described and interoperable. Acceptance of data not conforming to these standards is at the discretion of the NSIDC program and funding agency. Refer to NASA's standards as an example of the standards an NSIDC data management teams follow (https://earthdata.nasa.gov/user-resources/standards-and-references).

When data are deemed to be outside of the domain and mission of the NSIDC Programs, the Data Accession Coordinator attempts to direct the data producer to a more appropriate data repository (e.g. a general repository, another NASA DAAC or NSF repository).

[**See also ANNEX A.**]

Reviewer 1:

Accept

Reviewer 2:

Accept

IX. Documented storage procedures

Compliance Level: 3

Reviewer 1:

3

Reviewer 2:

3

R9. The repository applies documented processes and procedures in managing archival storage of the data.

NSIDC consistently strives to provide data archival and operations in a stable and reliable fashion. While NSIDC staff work a typical business schedule (M-F, 9-5 U.S. Mountain Time), NSIDC systems are operational 24x7 in a monitored machine room with backup power and active systems monitoring. NSIDC supports automatic user order fulfilment for many data sets, and posts notices of scheduled maintenance at least two business days prior to any planned maintenance.

NSIDC uses both on-site and off-site backups of all of archived data. All managed data in the NSIDC archives have at least two copies:

1) On-site on spinning disk.

2) On-site on a managed tape backup.

3) All non-ECS data (and select ECS data) additionally have a third copy stored off-site in a geographically separated data center on spinning disk.

NSIDC's data preservation posture is reviewed annually by measuring the archival strategies against risk of data loss and user impact to primary data system outage. NSIDC uses the NASA "Archiving, Distribution and User Services Requirements Document" (ADURD) and the "ESDIS Data Backup Analysis Report" as a guide to this review and adjusts archival strategies as needed.

Reviewer 1:

Accept. It is expected by the time of your next review that evidence can be provided of the availability of documentation on processes and procedures.

Reviewer 2:

Accept

X. Preservation plan

Compliance Level: 3

Reviewer 1:

3

Reviewer 2:

3

R10. The repository assumes responsibility for long-term preservation and manages this function in a planned and documented way.

Each program within NSIDC has a defined level of preservation in accordance with contractual requirements. Programs across NSIDC employ the use of Data Management Plans, Operational Agreements (OAs), and Interface Control Documents (ICD). These documents ensure communication and set expectations between NSIDC and a data provider as it relates to long-term data preservation.

For instance, the NASA DAAC program at NSIDC curates data for long-term preservation and usage in accordance with the NASA EOSDIS's data preservation guideline. Refer to https://earthdata.nasa.gov/user-resources/standards-and-references/preservation-content-spec.

The NOAA@NSIDC program at NSIDC curates data for long-term preservation and usage in accordance with NOAA's legislative mandate to permanently support long-term preservation of its data holdings. Refer to https://www.nesdis.noaa.gov/sites/default/files/asset/document/npd_6010_01a.pdf and https://www.glerl.noaa.gov/review2016/reviewer_docs/NOAA_PARR_Plan_v5.04.pdf

Refer to R3 Ongoing access and preservation.

Reviewer 1:

Accept. The evidence does not currently describe the basis on which (i.e., 'how') the repository takes responsibility of the long-term survival of the data.

Reviewer 2:

Accept

XI. Data quality

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R11. The repository has appropriate expertise to address technical data and metadata quality and ensures that sufficient information is available for end users to make quality-related evaluations.

NSIDC provides thorough data set documentation. Included are sections specific to data quality and integrity as reported by the data producer or documented through community feedback. The documentation includes a References and Related Publications section specific to peer-reviewed publications written about the data set. An example user guide can be seen here: https://nsidc.org/data/mod10a1. In addition, NSIDC maintains a listing of peer-reviewed publications from the earth science community describing their research and the use of particular data sets. Refer to MODIS Published Research https://nsidc.org/data/modis/research.html.

NSIDC metadata database, used to create and store data set metadata, enforces minimum metadata requirements and applies validation of valids from the Global Change Master Directory and schema requirements from NASA's Common Metadata Repository (CMR).

NSIDC DAAC staff also participate in the NASA Earth Science Data System Working Groups (ESDSWG) for Data Quality. As recommendations become codified, NSIDC leverages these recommendations for future best practices in capturing and disseminating data quality information.

Refer to R5 Organizational infrastructure (skillsets), R6 Expert guidance, R7 Data integrity and authenticity, R8 Appraisal, R12 Workflows and R14 Data reuse

Reviewer 1:

Accept

Reviewer 2:

Accept

XII. Workflows

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R12. Archiving takes place according to defined workflows from ingest to dissemination.

NSIDC employs two well established data management systems and associated workflows for data ingest, archiving and distribution:

1. NSIDC university data management system

2. NASA EOSDIS Core System (ECS)

Those data sets archived in the ECS, the primary system, follow the process outlined in the Polling with Delivery Record Mechanism Standard (https://earthdata.nasa.gov/user-resources/standards-and-references/polling-with-delivery-record-pdr-mechanism). The workflows are formally documented between each NASA Science Investigator-led Processing System (SIPS) and NSIDC DAAC in Interface Control Documents (ICDs) and Operations Agreements (OAs). NSIDC DAAC's implementation of this process involves automatically ingesting data files, metadata files, and any associated ancillary files from the data provider using a per-negotiated protocol (SFTP, SCP, HTTPs, or GridFTP). Data are then verified against the Product Delivery Record and, if successful, are archived first on spinning disk (where, if the data is to be public, can be accessed via an HTTPs endpoint) then to a tape backup. Metadata are parsed and stored alongside the data on disk and tape, as well as being sent to NASA's Common Metadata Repository for search and order functions. Inventory metadata (parsed from the metadata file or created by the ingest process, which includes the fixity information) is stored in a local database for validation and data management processes.

For data that is archived in the NSIDC university data management system, the process is more manual. A data transfer mechanism and manifest format is negotiated with the data provider and documented in an Operations Agreement and/or Data Management Plan, and the data are staged on spinning disk. The data are then verified against the manifest and are written to the archive where they may be accessed via HTTPs if the data are to be public. Nightly, the data are backed up to a tape backup system and to a secondary backup at CU Denver. Additionally, fixity information is generated at this point and stored in a local database for use in data validation and data management.

Updates occur similarly in either system - if a new major version of a data set is to be ingested, it is treated as a new entity and the previous version is moved to a non-public archive once the new version has been successfully ingested. In the case of a minor version change, individual files within a major version may be replaced and the fixity information updated (in the case of ECS this is automatic, while on our NSIDC university system, this is manual). The old versions of data (either major or minor version) may be kept in a non-public archive for a time depending on the retention policy of the

mission/project.

The software and hardware environment for both the ECS and NSIDC university systems is managed within Change Control and Configuration Management processes. The NSIDC employs a Change Control Board (CCB) to evaluate and schedule all modifications to the ECS system baseline, consisting of one test mode and one production mode. When software is delivered from the ECS development team, NSIDC Operations installs the software into the test mode and performs a system checkout following a regression test plan. If the software is working as expected, it is installed in the operational mode during planning maintenance and tested again.

NSIDC performs Configuration Management of the NSIDC university system through three main efforts: agile development with continuous integration and production deployment, a Technical Services Change Control Board (TSCCB) which reviews and approves changes to the production environment, and a Production Software Support (PSS) process for tracking and resolving software bugs and enhancements. Appraisal and selection of data as well as approaches for data outside of the mission/collection profile are described in Appraisal R8.

For the sensitive ELOKA data the following workflow is established, describing accessibility to the data for guest users as well as those approved by the AAOKH. Refer to Confidentiality/Ethics R4.

Community members (“observers”) send their observations by email, on paper, or by phone call to staff at AAOKH. AAOKH staff input these records into the online application/interface at ELOKA-arctic.org/sizonet. They are stored in a postGRES database on a virtual machine and images are stored in a CouchDB database on a separate virtual machine. Metadata for each image are stored both in the postGRES and CouchDB databases. The data are not transformed; however, typos in the original observation text may be corrected for clarity.

The application code pulls data from the postGRES and displays it in the application interface. The application shows the general observations in the selected data record if the user logged in as a guest. If the user logged in with community-level credentials, it shows the general observations as well as the private “transcript”. They are delivered on the interface itself for viewing. In 2018, ELOKA created a download feature that allows users to download the data search results as a CSV file. Again, if the user is a guest, they will not receive the private data in the CSV file. If the user is credentialed, the CSV file will contain that private data.

The JSON web based token based user authentication process is used for downloading data in a CSV file. The Rails application secrets key to encrypt and decrypt the web based tokens which contain the user's ID is used. The secrets key is not stored in the database rather it is set as en environment variable on the server.

Builtin Rails application framework mechanisms for user authentication is also used. When a user creates a login account is created with a unique email address, a password is encrypted by the Rails application and stored encrypted in the database. Subsequently when a user attempts to login again, the email address is used to find the user's record in the database and the Rails provided "authenticate" method is used to verify the password. The encrypting and decrypting of the password is done by Rails behind the scenes.

Reviewer 1:

Accept

Reviewer 2:

Accept

XIII. Data discovery and identification

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R13. The repository enables users to discover the data and refer to them in a persistent way through proper citation.

To facilitate discovery and accessibility, NSIDC operates the enhanced cross-center Scientific Data Search, providing discovery and data access capabilities (http://nsidc.org/data). Programmatic data access is also available for NSIDC data through Application Programming Interfaces (https://nsidc.org/api). And, NSIDC Labs offers access to tools and services that may be experimental, proof of concept, or in an early phase of development (https://nsidc.org/nsidc-labs).

NSIDC is a member of DataCite, and assigns Digital Object Identifies (DOIs) to all data sets through the California Digital Library or NASA's DOI minting process. Dynamically generated, persistent data landing pages (URLs) display DOIs as part of the data citation under the "Citing These Data" tab (https://nsidc.org/data/g02202/versions/3). NSIDC is registered as part of the Registry of Research Data Repositories (R3) for further accessibility.

Reviewer 1:

Accept

Reviewer 2:

Accept

XIV. Data reuse

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R14. The repository enables reuse of the data over time, ensuring that appropriate metadata are available to support the understanding and use of the data.

NSIDC develops collection and/or file-level metadata for all data sets to represent and preserve data provenance and usage information. This metadata is available a range of formats (e.g., ISO, FGDC, DIF) through open web services to support interoperability.

Standard, self-subscribing data formats, such as NetCDF, HDF or GeoTIFF, are required or encouraged, depending on the standards set forth by the agencies sponsoring the data management programs. NSIDC maintains legacy data sets that were developed before self-subscribing formats were common or used. Where possible, NSIDC has developed tools to work with these data formats or assisted in the reformatting of data to increase usability. These transformation exercises are dependent on available funding from the sponsoring data management agencies. Refer to R8 Appraisal.

NSIDC curates a thorough level of documentation for each data set, which includes data structure, algorithm description, processing steps, and peer-reviewed publications outlining the data set production and algorithm. Refer to https://bit.ly/31RCkCl or https://nsidc.org/data/mod10a1. For NASA DAAC mission data sets, the data production software may also be available through a Delivered Algorithm Package (DAP).

Refer to R2 Licensing, F7 Data integrity and authentication and R12 Workflows.

Reviewer 1:

Accept

Reviewer 2:

Accept

TECHNOLOGY

XV. Technical infrastructure

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R15. The repository functions on well-supported operating systems and other core infrastructural software and is using hardware and software technologies appropriate to the services it provides to its Designated Community.

Core hardware and software infrastructure

- Commercial hard drive enclosures configured as a redundant array of disks.
- Interconnected fiber channel fabric
- Server and storage system are networked with 1Gb and 10Gb ethernet
- Stornext software to manage filesystem metadata and data management across disk and tape platforms
- All hardware is equipped with redundant power supplies (2)
- On-site short term (15 minutes) UPS battery backup
- On-site diesel generator provides power during extended utility power outage
- Offsite disaster recover infrastructure; NFS server, disk arrays
- A thorough software inventory database is maintained internally
- Hardware inventory and system documentation maintained internally

Near real-time data is available and provisioned for public access. Internal 10Gb and fiber channel networks combined with the university's network infrastructure provide abundant bandwidth. NSIDC data products are consumed by science users around the world.

With the NASA DAAC, NSIDC has funding to engage in scheduled updates to hardware infrastructure. An annual evaluation of all hardware is done to review its status and ability to perform within expectations. Most hardware is on a five year refresh schedule.

Infrastructure hardware is reviewed and assessed annually. Servers and data storage equipment are replaced on an five to seven year rotation.

Reviewer 1:

Accept

Reviewer 2:

Accept

XVI. Security

Compliance Level: 4

Reviewer 1:

4

Reviewer 2:

4

R16. The technical infrastructure of the repository provides for protection of the facility and its data, products, services, and users.

The NASA EOSDIS Core Systes (ECS) IT security system:

Has a designated security officer

Utilizes a dedicated firewall appliance

Successfully passes audits by a federal government agency

Has Federal Information Security Management Act (FISMA) compliant:

- System Security Plan
- Risk Management Assessment
- Is rated FIPS-199 'low' in risk

Annual contingency exercise results reported to a federal government agency

The ECS and non-ECS intranets share certain IT security system function:

University campus firewalls filter some kinds of generic attack vectors

- NSIDC-specific campus firewall rules further limit attack vectors NSIDC servers

University campus intrusion detection systems analyze inbound traffic using generic rules

University campus network scans identify Internet-visible vulnerabilities for impact analysis and possible remediation

The University campus data center has two factor authentication for physical entry and FISMA approved environmental controls and alarms

Additional layers of IT security protection are provided by:

- NSIDC-specific intrusion detection system that analyzes inbound and outbound traffic using NSIDC-specific rules and industry accepted rules
- Historical repository of NSIDC-specific netflow data for forensic analysis is stored locally and also at an off-site government agency location
- Short term repository of select network packets for forensic analysis
- Honeypots that improve intrusion detection probabilities
- Periodic local network scans are used to identify local vulnerabilities for impact analysis and possible remediation

Refer to R7 Data integrity and authenticity, R9 Documented storage procedure, R15 Technical infrastructure.

Reviewer 1:

Accept

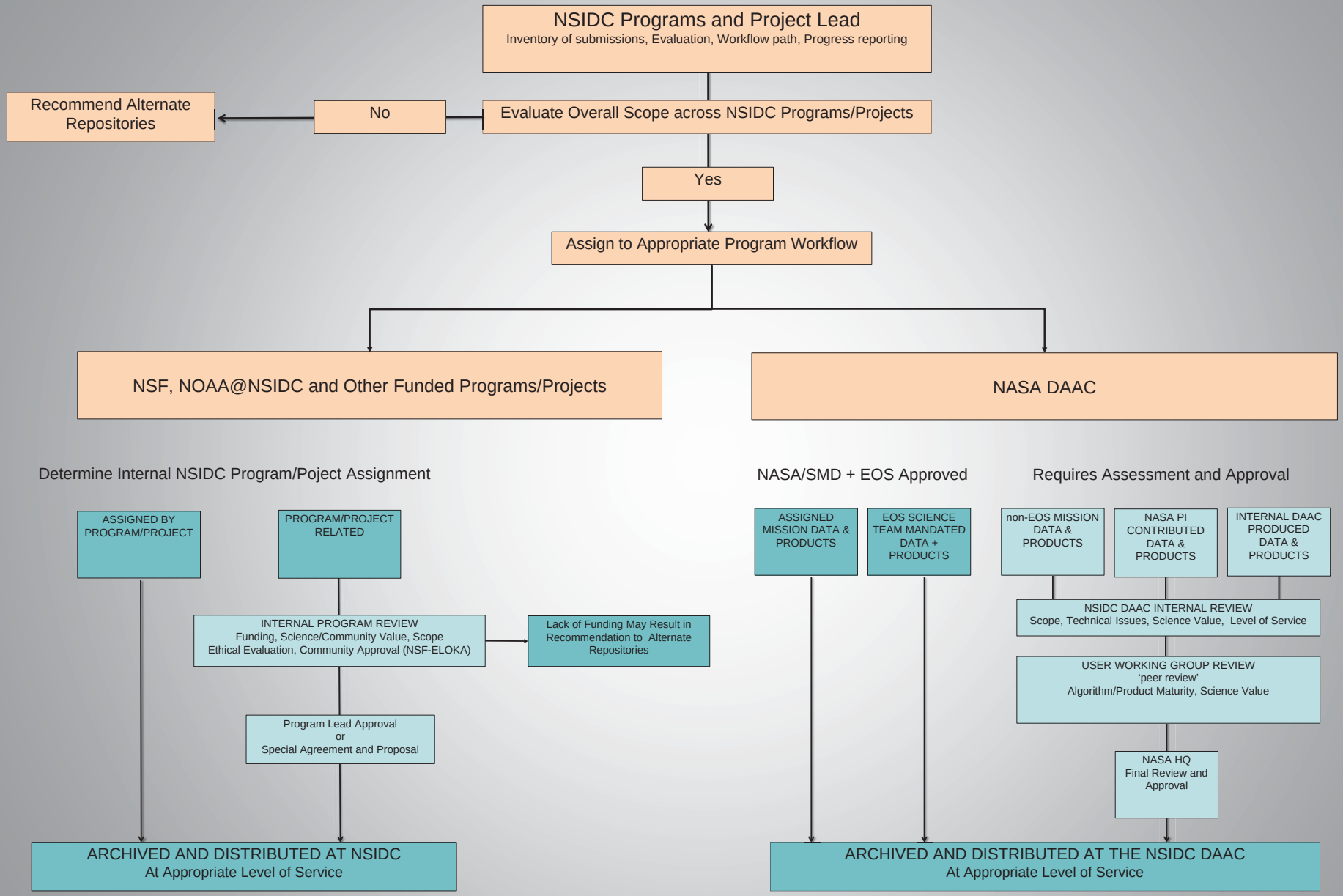
Reviewer 2:

Accept

APPLICANT FEEDBACK

Comments/feedback

ANNEX A
Data Contribution Workflow



Note: NSF-ELOKA contributions are generally service requests for building interactive applications in support of local and indigenous knowledge data.