

ESIP Evaluation Proposed Metrics and Metrics Definitions

The following list of evaluation metrics (quantitative data) and nuggets (qualitative data) were developed by the University of Maryland ESIP Evaluation Team. They are based on earlier ESIP evaluation work, and were developed iteratively through discussions with the ESIP projects and management. Please send us your comments at the email addresses above.

We are proposing to collect these metrics quarterly from each ESIP project through two web forms: one for the metrics, and one for the nuggets. Both the metrics and the nuggets would be instantly viewable in a viewer interface.

Not all of the following metrics are applicable to all ESIPs. The projects will be encouraged to provide numbers for the applicable metrics, accompanied by clarifying comments. The role of the comments is to clarify the numbers given and explain their meaning for the individual ESIP project.

Legend:

- * original four metrics
- ** metrics added from the DAAC/GPRA list

USERS

METRIC: Number of data and service users

Definition/Example

- Opposed to mere information consumers, “Data and service users” **acquire data** (download, order, etc.) **or use a service** provided by the ESIP (data processing, legal service, experiment data management).
- Data and service users should be **identified** at least by their email address. Users placing orders need to provide an address anyway so they are always identified, and ESIPs are strongly encourage to require registration for all users downloading data or using services (minimum requirement is an email address)
- Comments should mention if registration is used or not, and if possible separate **self-service users** (people who download via ftp) from **users ordering via staff** (who use ESIP customer services)
- Example for the first quarter:
 - Number of data and service users: 238
 - Comments: Registration is in now place. About 90% used the download, others ordered by email

METRIC: Categorization of data and service users by domain

Number of users in each category:

US Gov, US Other, US Education, US Comm, US non profit, Foreign, Unknown
(would allow comparison with DAACs categorization)

METRIC: Categorization of data and service users by market share

For each category: answer:

- Does your ESIP offer something of use to this market?
- Do you have good evidence of use by this market?
 - If yes: number of users
- Can't tell

Categories:

City/County/state Gov., US Gov., Agriculture, Forestry, Fisheries, Extraction, Eng./Const.Dev., Real Estate, Transportation, Insurance, Legal, Environmental Monitoring, Utilities, Tourism/Recreation, Intelligence, Education, Media, NGO/non profits, Commodities.

(This is better than the domain categorization, but we expect that for a while ESIPs won't be able to answer, nevertheless asking the question will encourage ESIPs to instrument the corresponding data collection, e.g. user registration or survey)

METRIC: Number of information consumers

Definition/Example

- Consumers are all users who come to find information or learn from ESIP information but do not necessarily download data or use services (e.g. readers of ESIP pages, museum patrons using an exhibit, school children using an ESIP produced tutorial on earth science)
- For public access websites without registration, count unique IP addresses hitting your web home page each month.
- Consumers are usually not identified individually
- The comments can give an estimate of the type of users and their distribution.
- Example for the month of January:
 - Number of consumers: 3700
 - Comments: About 1500 patron users, 1000 elementary school children, 1200 users of our website.

METRIC: Categorization of information consumers by domain

Number of consumers in each category:

US Gov, US Other, US Education, US Comm, US non profit, Foreign, Unknown

METRIC: Categorization of information consumers by market share

For each category: answer:

- Does your ESIP offer something of use to this market?
- Do you have good evidence of use by this market?
 - If yes: number of users
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Categories:

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METRIC: Total number of distinct customers*

Will be calculated automatically as the sum of the 2 previous metrics (consumers + data/service users)

METRIC: Number of repeat users

We use the definition used by the DAACs: Anyone who was a data or service user before.

DATA AND SERVICES

METRIC: Data volume*

The volume in gigabytes of data available to users via ftp or via staff special orders. Comments could also include a break down of volume by data type or format.

METRIC: Total data volume in archives, including data not available to users **

Includes public and not public data, all data uploaded.

METRIC: Number of datasets

NOTE: we will use the number provided by GCMD directly.

METRIC: Number of data products delivered*

This includes products emailed, ftp-ed, or media ordered and delivered. Do NOT include promotional materials distributed at conferences or donated to potential users with no assurance that the product will be used. Do NOT include the number of Web pages read by users (effective dissemination of information on websites will be measured by the number of users hitting the website) Comments can clarify what those products were.

METRIC: Volume of products delivered**

Total volume of products delivered to users.

METRIC: Number of new datasets not available before the federation

Number of new datasets, comments can include the list of datasets.

METRIC: Number of services available to users

Comments could include a list of those services

METRIC: Number of services that were not available before the federation

Comments could include a list of those services, for easier comparison to baseline.

METRIC: Number of services rendered

Comments can clarify the type of service provided. Example: number of subsetting done, number of rejections done, number of ingestion service performed, etc. To improve this metric a taxonomy of services would be needed to differentiate simple and complex services)

METRIC: Number of institutions that use your algorithm, software components, or user interface modules in their system

This metric can accommodate ESIPs that provide software products or services to other projects.

METRICS: Delivery time of data or service*

For the total number of products delivered and/or services rendered, estimate of the percentage in each category. Separate products and services in reporting.

e.g.

- 90% immediate (web/ftp)
less than 3 working days
- 10% less than 5 working days,
less than 10 working days
less than a month
more than a month
- 1% special cases (justified long delivery time)

The average time for an ESIP would hide variations between services. Knowing the number of products and services delivered, we can calculate the total federation number of product and services in each time category.

METRIC: Number of non-web information/promotional products delivered

This metric includes promotional CD, brochures, posters etc. This is a data related metric that will be useful to measure outreach and activities of emerging projects.

METRIC: Total number of web pages hits

This is useful for ESIPs that do not have traditional delivery of products or services per se (e.g. a museum exhibit).

METRIC: User satisfaction survey**

Vanessa Griffin took charge of this task, will develop user satisfaction survey form that all ESIPs can use.

METRIC: Error tracking**

This is a GPRA metric defined and used by the DAACs:

Error: Problem in data delivery, whether system induced or staff error.

Types of errors:

1. Wrong item.
2. Incomplete order (data, documentation, or software)
3. Physical error (bad media, corruption, broken)
4. Incorrectly produced (production error, not algorithm error)

Multiple errors in the same order are only counted as one error.

IMPACT AND OTHER NUGGETS

A nugget entry form is being created with:

- ESIP name
- Month (with today as default)
- Title
- Free text entry
- Nugget type
- Email of person entering nugget

A reminder to enter nuggets could be mailed to all ESIPs monthly.

We can generate a number of entries for each type of nuggets.

Those nuggets might be formalized in metrics later on.

Nugget topics:

New science:

- New type of data use
- Significant new science discovery linked to the existence of the ESIP
- New data products generated from ESIP data or services and now available to the community
- Data quality achievement

Federation activities:

Creation of workgroup or committee
Notable results from working group or committee
Example of federation collaboration
Collaboration with other institutions

Federation reactivity:

Rapid response to adverse event
Rapid dissemination of data or service

Dissemination:

Publications written by ESIP users referring to ESIP data (also report at publication time)
PR events (e.g. Presentation by ESIP staff at conferences or community events)
Mention of ESIP in press

Education:

New K-12 education activities generated from ESIP
New higher education or professional education activities generated from ESIP

Student graduated whose work was directly linked to ESIP

Miscellaneous:

- Steps toward sustainability
- Work in progress (step toward achieving milestones)
- Impact on citizens, business
- Quotes from users or federation members
- Other (e.g. number of lives saved)

OTHER CONSIDERATIONS

User satisfaction (from survey)

On hold – waiting for Vanessa who volunteered to get this started

Overall satisfaction with the ESIP (mandated metrics)

and for appropriate subsets of ESIPs: (volunteer metrics)

- Satisfaction with data processing services
- Satisfaction with data
- Satisfaction with data description (metadata)
- Satisfaction with cost
- Satisfaction with speed of delivery
- Satisfaction with quality
- Satisfaction with customer services

(all using a scale of 1 to 9/best)

Question: that's a lot of questions!