EARTH OBSERVATION ASSESSMENT DATA VISUALIZATION DASHBOARD USER GUIDE (INTERNAL FEDERAL REPORT)

Based on a Study by the USGEO Earth Observations Assessment Working Group, Sustainability (CENRS), National Science and Technology Council (NSTC)

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Document Purpose

The purpose of this document is to inform a user how to navigate, download, and cite data from the U.S. Group on Earth Observations (USGEO) Earth Observation Assessment (EOA) through the EOA Data Visualization Dashboard.

Introduction

The EOA Data Visualization Dashboard currently displays data collected in EOA 2023. The tiles in this dashboard can be explored to answer a variety of key questions including observing system and product use, strategic goal support, and current architecture performance. For additional information on how the EOA data was collected/analyzed and a glossary of definitions, please reference the Methods Guide[1].

Dashboard Navigation

The EOA Data Visualization Dashboard was built using Tableau™ software and hosted on the USGS Cloud Hosting Solutions (CHS) Tableau™ Server. A separate dashboard has been created for each Societal Benefit Area (SBA) included in EOA 2023. To navigate the dashboard, a user can interact with the dashboard directly on the USGEO website at usgeo.gov/eoa. For best results, use the Microsoft Edge browser, but most functionality is retained in Google Chrome as well. For some monitors, a user may have to zoom out to view all dashboard features. The dashboard is organized into seven unique views that can be toggled through to view and manipulate a variety of EOA data.

Visualization Tiles

The dashboard is organized in a Tableau™ Story format that allows a user to navigate different views using the tiles at the top of the visualization. Each view has a specific purpose, noted in its sub-section, that can be answered using EOA 2023 data.

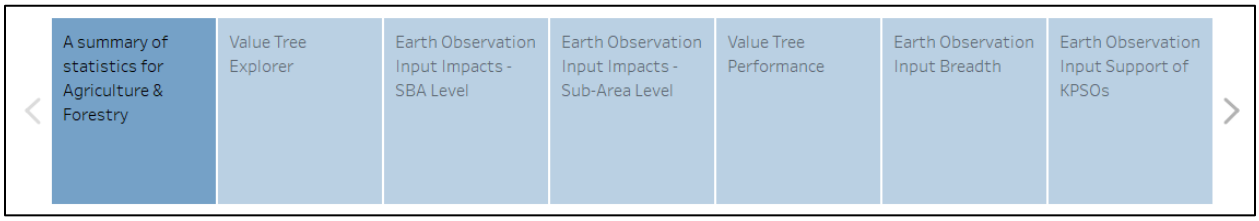

Figure 1: Visualizations can be selected by clicking on the blue tiles at the top of the page.

Tiles can be viewed by clicking on the blue box with a visualization name or using the arrows on the left/right of the boxes.

[1] https://usgeo.gov/eoa/uploads/EOAMethodologyReport_July_2024_Final.pdf

Filtering

Filtering visualizations can make it easier to navigate to data of interest. There are four different filter types used in this dashboard: radio button selections, text search entries, sliders, and graph interactions.

Radio buttons

Radio buttons are a feature in Tableau™ that allow a user to select from a limited set of options, selecting only one at a time.

Figure 2: Radio button filter for Sub-Areas in the Agriculture & Forestry Societal Benefit Area.

As an example, the Agriculture & Forestry Impact Percentages by Sub-Area columns, located on the "Earth Observation Input Impacts - Sub-Area Level" tile, can be changed by selecting the radio buttons associated with the Sub-Area of interest.

Check boxes

Multi-select check box filters are a feature of Tableau™ that allow a user to select from a large set of options, selecting as many as desired.

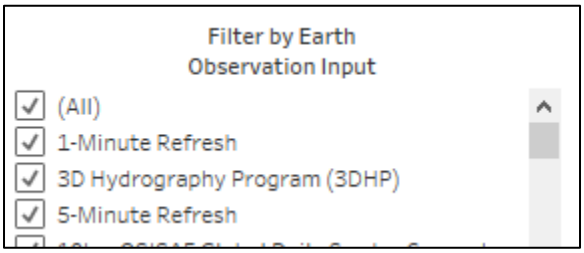

Figure 3: Check box filter for Earth Observation Inputs in the Agriculture & Forestry value tree.

As an example, the Agriculture & Forestry Impact Percentages by Sub-Area Earth Observation Inputs list on the left, location on the "Earth Observation Impacts - Sub-Area Level" tile, can be changed by selecting the check boxes associated with the Earth Observation Inputs of interest.

An additional feature of multi-select check boxes is the ability for a free text search of the items, to ease in filter navigation. To show the search filter feature, hover over the top-right corner of the check box filter and click the magnifying glass. A search bar will appear where you can enter text to reduce the number of items in the check box list.

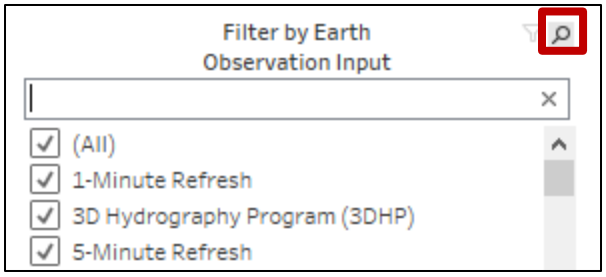

Figure 4: Magnifying glass will appear when a user hovers over the top-right corner of a check box filter, allowing a user to type in values to a search query on the list.

Selection slider

Selection sliders are a feature in Tableau™ that allows a user to filter a set of numerical data based on its value.

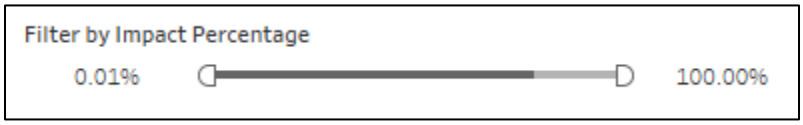

Figure 5: Selection slider filter in the dashboard.

As an example, a user can filter the number of key products, services, or outcomes (KPSOs) viewed in the Earth Observation Input Impact on KPSOs tile by moving the "Filter by Impact Percentage" slider.

Graph element filter

When a view has more than one graph element or table displayed, the data on any given graph or table can be selected to filter the other graphs/data in the view. A user can click on the same graph element again to remove a filter.

As an example, the Earth Observation Inputs Identified statistic on the tile labeled "A summary of statistics for Agriculture & Forestry", can be filtered by clicking on the KPSOs by Org Bar Chart. Selecting the US Department of Agriculture bar will filter the statistics to only those relevant to the KPSOs that are under the US Department of Agriculture.

Sorting

When a view includes a data table, the table can be sorted alphabetically or numerically by any column of interest. To show the sort feature, hover over the column title and click the hierarchy indicator.

Figure 6: Table sort function.

As an example, the Value Tree Explorer table on the "Value Tree Explorer" is organized into five columns. To sort on the organization within a KPSO group, hover over the "Organization" column

and click the "A-Z" icon. Note that for sortable columns the sort options are appropriate to that column type.

Tool tips

All graphic types include additional information about the data in tool tips. To show a tool tip, hover over a data point or table/chart element.

As an example, in the "Summary statistics for Agriculture & Forestry" tile a user can hover over a bar in the "Key Products, Services, and Outcomes (KPSOs) by Organization" bar chart and view the count of KPSOs as well as the organization name spelled out.

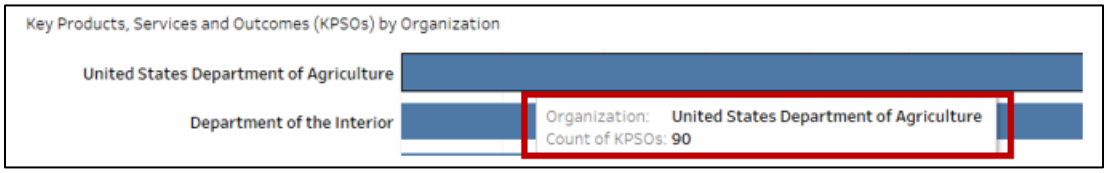

Figure 7: Tool tip example. When a user hovers over a bar chart, the organization name and number of KPSOs in the tree are shown.

Dashboard Elements

Statistical Summary

Purpose

The purpose of the Statistics Summary tile is to allow a user to view high level statistics associated with the SBA's EOA data. This view can be used to report participation in the assessment and scope of the assessment.

Data Fields

Field/Element Name	Description
Earth Observation Inputs Identified	Number of Earth observation inputs identified in support of the SBA. *
Subject Matter Experts (SMEs) Interviewed	Number of SMEs interviewed in support of the SBA. *
Total Accumulated Years of SME Experience	Cumulative sum of years of experience for all SMEs interviewed in support of the SBA. *
Total Products Surveyed	Number of products surveyed in support of the SBA. *
Number of Key Products Overall	Number of key products identified in support of the SBA. *
Number of Key Products per Sub-Area	Number of key products identified under each Sub-Area in the SBA. Note that a KPSO may be present multiple times in the tree so total may not add to the total number of KPSOs. *
Key Products, Services, and Outcomes (KPSOs) by Organization	Bar graph disaggregating the KPSOs by organization.
* Value changes based on view filter options.	

Value Tree Explorer

Purpose

The purpose of the Value Tree Explorer tile is to allow a user to view and manipulate the value tree structure for the specified SBA. This view can be used to dive into the value tree structure and get an idea for the scope of the SBA.

Data Fields

Field/Element Name	Description
Sub-Area	Name of the Sub-Area in the specified value tree
Key Objective	Name of the Key Objective in the specified value tree
KPSO Group	Name of the Key Product, Service, or Outcome (KPSO) Group in the specified value tree
Organization	Name of the organization the Key Product, Service, or Outcome (KPSO) is owned by
KPSO Name	Name of the Key Product, Service, or Outcome (KPSO) in the specified value tree

Additional View Information

KPSO descriptions defined during the assessment can be viewed in the table tool tip.

Earth Observing Input Impacts – (SBA and Sub-Area Level)

Purpose

The purpose of the Earth Observing Input Impacts tile is to allow a user to explore the final impact data produced during the assessment. This view shows the relative impact of each Earth Observation Input on a specific part of the value tree. The structure of the value tree is provided in the Value Tree Explorer tile.

Data Fields

Field/Element Name	Description
Earth Observation Input	Name of an Earth Observation Input identified in support of the SBA.
SBA/Sub-Area/Key Objective	Name of an SBA, Sub-Area, or Key Objective selected by the user to view.
Impact	Color and category indicator of how much impact an EOI had on a specific part of the value tree relative to all other inputs.

Additional View Information

The impact categories were calculated by normalizing the percent impact an Earth Observation Input (EOI) has on a node to the highest impact for that node. The below legend indicates the thresholds identified:

Category	Normalized Thresholds	Description
Highest	35% - 100%	EOI provides the **highest contribution** to support the value tree node compared to any other input.
Very High	15% - 35%	EOI provides **critical contribution** to support the value tree node.
High	7% - 15%	EOI provides **significant contribution** to support the value tree node.
Moderate	1% - 7%	EOI provides **notable contribution** to support the value tree node.
Contributes	0.2% - 1%	EOI provides **some contribution** to support the value tree node.
Supplemental	0% - 0.2%	EOI provides **minimal contribution** to support the value tree node.
Does not Contribute	0%	EOI provides **no contribution** to support the value tree node.

Value Tree Performance

Purpose

The purpose of the Value Tree Performance tile is to allow a user to see the current performance of the value tree and evaluate the impact on the performance if a selected Earth Observation Input is removed from the analysis.

Data Fields

Field/Element Name	Description
Societal Benefit Area	Name of the SBA.
Sub-Area	Name of each Sub-Area in the SBA.
Key Objective	Name of each Key Objective in the SBA.
KPSO-Group	Name of each KPSO-group in the SBA.
Performance Category	Color and category indicator depicting the performance of a node in the value tree today.
Performance Category when Earth Observation Input is Removed in Analysis	Color and category indicator depicting the performance of a node in the value tree if a user-selected EOI is removed from the analysis.

Additional View Information

The performance category is directly tied to the Performance Scale used during elicitation. This value represents how well a certain node in the value tree is performing today and allows a comparison to what that performance would be if a certain Earth Observation Input was removed, showing dependence on it.

100	Ideal	Meets all requirements and exceeds some
90	Fully Satisfied	Meets all requirements
80	Good	Meets all major requirements with minor limitations
70		
60	Fair	Meets most major requirements, with significant limitations
50		
40	Poor	Fails to meet many major requirements, but provides some value
30		
20	Very Poor	Fails to meet most major requirements, but provides minor value
10		
1	No Capability	Provides no value

Figure 8: Reproduction of the Performance Scale used during elicitations that correspond to value tree node performance scores in analysis.

Performance Category	Threshold	Description
Ideal	100	Meets all requirements and exceeds some
Fully Satisfied	90-99	Meets all requirements
Good	80-89	Meets all major requirements with minor limitations
Fair-to-Good	70-79	
Fair	60-69	Meets most major requirements, with significant limitations
Poor-to-Fair	50-59	
Poor	40-49	Fails to meet many major requirements, but provides some value
Very Poor	0-39	Fails to meet most major requirements, but provides minor value

Earth Observation Input Breadth

Purpose

The purpose of the Earth Observation Input Breadth tile is to allow a user to see metrics associated with the depth of impact the Earth Observation Input has on the SBA as a whole (Impact %), as well as the breadth of that impact across the value tree (Number of KPSOs Impacted).

Data Fields

Field/Element Name	Description
Impact	The percentage impact a single Earth Observation Input has on the SBA as a whole.
Number of KPSOs Impacted	The distinct count of key products that are impacted

Additional View Information

Data in the chart can be filtered using the table on the bottom, and conversely by clicking on an element.

Earth Observation Input Support of KPSOs

Purpose

The purpose of the Earth Observation Input Support of KPSOs tile is to allow a user to dive into a single Earth Observation Input and see the KPSOs it supports. This view quantifies the supportive relationship between an Earth Observation Input and a given KPSO by displaying the relevant impact percentages.

Data Fields

Field/Element Name	Description
Agriculture & Forestry KPSOs Supported (208 Total)	Name of the key products in the SBA impacted by the user-selected Earth Observation Input.
Impact of EOI on KPSO	The percent impact a user-selected Earth Observation Input has on each key product in the SBA.

Additional View Information

The Impact Percentage Filter can be used to decrease the number of KPSOs shown in the chart.

The Earth Observation Input Filter can be used to select the Earth Observation Input of interest that the chart displays.

Data Download

To download the visualization data, a user can click the download icon at the bottom-right of the screen which will pop up a download selection window. Options for download include image, crosstab (.csv), .pdf, or PowerPoint.

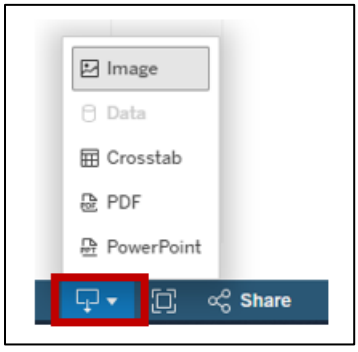

Figure 9: Data can be downloaded/viewed by clicking the box with an arrow in bottom right corner of the visualization.

Citation

To cite any data from this dashboard use the below “Chicago” style formatting with the date accessed:

"US Group on Earth Observation, Current Earth Observation Assessment. US Group on Earth Observation, URL:https://usgeo.gov/eoa/current.html (Accessed July 21st, 2024)"

Additional Information

For a full list of acronyms used in the visualization, reference the EOA Data Visualization Acronym List. (https://usgeo.gov/eoa/uploads/Data%20Visualization%20Acronym%20List.pdf).

For additional information on how to use the EOA Data Visualization Dashboard, contact usgeo.eoa@noaa.gov We also welcome your feedback on the dashboard and user guide.