

Details About Implementing the Snowball Metrics Framework

PURPOSE AND MISSION

Chief Research Officers (CROs) from the five Battelle-managed U.S. Department of Energy Laboratories convened the Battelle Snowball Metrics Working Group in 2017 to utilize the Snowball Metrics framework to build and employ a method to calculate metrics that would enable the laboratories to better understand their strengths and weaknesses.

The result of numerous virtual meetings was a report delivered in January 2018. It addressed recommendations for effective implementation, and a starting set of four Snowball Metrics with recipes. The CROs accepted the recommendations.

DATA SOURCES AND REPORTING

Selecting Clarivate Analytics' *Web of Science* and *InCites* and Elsevier's *Scopus* and *SciVal* as valid data sources accommodated resource availability for each laboratory, as well as data transparency and defensibility. Using two different data sources does create variability in the final values, which can be confusing to stakeholders with a lack of knowledge about their interpretation. Customizing the base Snowball Metric recipes for our environment promoted uniformity of data collection and analysis practices. Guidance about the conditions affecting data values with benchmarking activities is included.

Data values represent the previous calendar year of outputs. The group recommended collecting data values annually and when the date of the data source's last update is late February or early March. This timing coincides with the second quarter of the Federal government's fiscal year. Each laboratory uses a template to report its final data values. A member is chosen to consolidate the data into a brief report that is provided to stakeholders.

FUTURE CONSIDERATIONS

Broadly scoping research impact questions. The Department of Energy evaluates Office of Science national laboratories using the Performance Evaluation Measurement Plan (PEMP). The PEMP framework uses a common structure and scoring system across all ten laboratories and includes a set of eight goals and supporting objectives as well as laboratory-specific notable outcomes that are documented at the beginning of each fiscal year. Future iterations of this project would benefit from exploring cross-laboratory commonalities and potentially using some of those stated goals/objectives/notable outcomes as guidance for recommending additional Snowball Metrics.

Expanding the breadth of the document types that are analyzed. Peer-reviewed journal publications, conference papers, and book chapters are the only output types considered in the analysis. However, all of the laboratories produce a significant amount of technical reports and other gray literature. Not including these outputs produces an incomplete evaluation of impact. Despite the inherent difficulties of tracking this data, it behooves the group to find a way.

Re-evaluating FTE normalization schemes. The definitions of (full-time equivalent) FTE or researcher vary across participating laboratories. To develop consistent and meaningful analyses, it is important for the group to arrive at common definitions for these terms, and then on a laboratory-by-laboratory basis establish clear and consistent data gathering methods.

Snowball Metrics in the Battelle-managed DOE National Laboratories

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OBJECTIVE AND RESULTS

Use the Snowball Metrics framework to standardize the bibliometric measurement practices of five Battelle-managed U.S. Department of Energy (DOE) laboratories with varying missions.

Four Snowball Metrics were selected. This report details the customized recipes and recommendations for implementation:

<https://doi.org/10.2172/1462196>



ABOUT THE DATA PRESENTED

These graphs show data collected in March 2018 for calendar year 2017 outputs from three laboratories. These laboratories were chosen to exemplify the diversity in science mission, FTE count, and data source availability within the working group.

- Labs A and B: Clarivate Analytics' InCites
- Labs A and C: Elsevier's SciVal
- Staff internal to each lab provided data for Intellectual Property Volume.

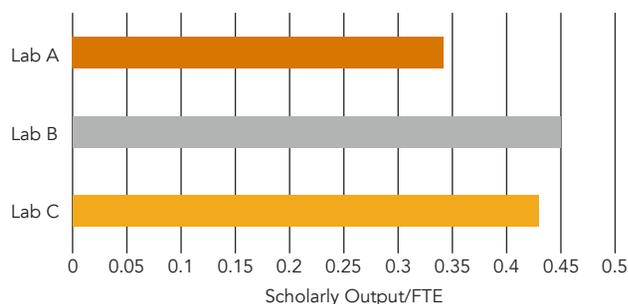
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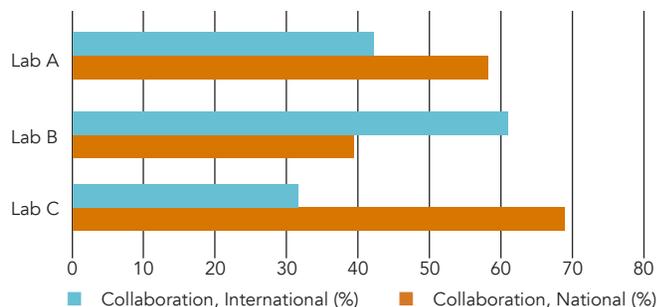
SCHOLARLY OUTPUT/FTE

Journal and conference article output is a vital metric to all DOE laboratories. The laboratories do not calculate FTE in a consistent manner. Even though output per FTE puts us on the path to normalizing output to organizational size, the resulting data lacks internal consistency.



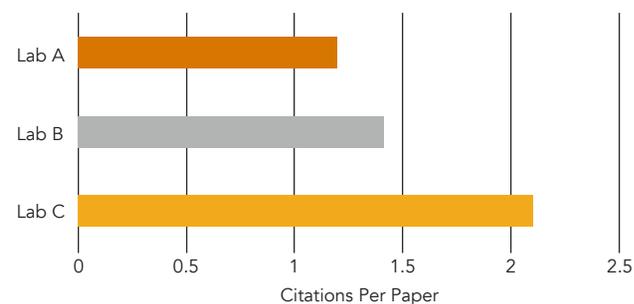
COLLABORATION

The percentage of publications that include external collaborators provides some indication of an organization's influence in the greater scientific and research community. Some laboratories are engaged in large group collaborations. Our recipe highlights how these groups may impact this metric.



CITATIONS PER OUTPUT

Total citation count favors larger laboratories as they are likely to publish more and therefore have greater citation potential. Normalizing citations to output allows us to account for laboratory size differences while eliminating the ambiguities of the FTE metric.



INTELLECTUAL PROPERTY VOLUME

The types of intellectual property quantified include U.S. non-provisional patent applications, U.S. patents granted, and the number of license agreements. Representatives from the DOE Technology Transfer Working Group collaborated on this metric in support of efficient data acquisition practices. The data for this metric is not normalized.

