Practical Applications of a Participatory Science Project Evaluation Tool:

Perspectives from Across Earth and Space Science

Supplemental File 3: Aurorasaurus SPI Utilization

Table 1: Condensed table of Aurorasaurus Science Products. API: application

programming interface.

Category	Science Product	Aurorasaurus
Written	Dissertations, theses (#)	One thesis
Written	Grants awarded (#, $)	7 grants
Written	Reports (#)	2 white papers, including one for *Astronomy Decadal Survey*, NSF annual grant report 2013-2017
Written	Scholarly publications (#)	28+ publications
Data	APIs (Y/N)	Our own API and we use the Twitter search API
Data	Data packages (#)	76 downloadable files on Zenodo
Data	Metadata (Y/N)	Description is in Kosar et al. 2018
Data	Requests (# requests, transfer	5,929 unique downloads on Zenodo, totaling 111.7 GB

	volume)	
Data	Specimens/samples (#)	More than 7,000 reports; plus tweets, photos and observation numbers in AWS database
Data	Visualizations (Y/N)	Aurorasaurus map, graphs as figures in publications
Management and Policy	Decision support (Y/N)	No, but participatory science stakeholders use the map and data to make their own decisions.
Management and Policy	Forecasting/models (Y/N)	Increasing accuracy of OVATION Prime aurora forecasting model
Management and Policy	Regulatory action (Y/N)	No
Communication	Blogs (Y/N)	57 Aurorasaurus blog posts + 7 NASA features
Communication	Newsletters (Y/N)	10 newsletters, 2016–17
Communication	Presentations (Y/N)	43+
Communication	Videos (Y/N)	Aurorasaurus YouTube: 16 videos, 5 playlists
Communication	Website (Y/N)	Aurorasaurus website

Table 2: Condensed table of Aurorasaurus Data Practices.

Category	Data Practice	Aurorasaurus
Findable	Data available from project website (Y/N)	No. Data is visible in real-time but not downloadable
Findable	Data available from repositories or registries (Y/N)	Yes
Accessible	Downloadable data file(s) available (Y/N)	Yes, from Zenodo
Accessible	Tools for data exploration (Y/N)	Map display of data. Queryable to past dates. Not offline software exploration
Accessible	Data licensing specified (Y/N)	Yes: Creative Commons Attribution Non Commercial 4.0 International
Accessible	Metadata available (Y/N)	Some metadata displayed on map
Accessible	API documentation (Y/N)	Not sure
Interoperable	Data recorded in standard formats for discipline (Y/N)	No, standard format not yet established

Reusable	Uniqueness of data (describe)	Accurate real-time aurora prediction does not exist. Aurorasaurus collects real-time, ground-based aurora data
Reusable	Time scale of data (# yrs)	5 years
Reusable	Spatial scale of data (describe)	Inhabited areas of Earth that experience auroras—geographic boundary changes depending on space weather and other conditions
Reusable	How much data (# data points, describe)	9,519 raw observations in 2015-16, but the program has been in place since 2014
Reusable	Errors documented (Y/N)	Tweet validation process in place
Reusable	Quality assurance or quality control documented (Y/N)	Yes, in report (Kosar et al, 2018)
Reusable	Changes documented (Y/N)	Github on software; version control
Reusable	Questionable data flagged (Y/N)	No
Reusable	Software or platform development (Y/N)	Open-source platform could be adapted for other projects, none to date

Note: Aurorasaurus utilized the Science Products and Data Practices inventories to identify the project's products, activities, and practices. Then, they quantified the items to create these condensed tables that reflect the project's accomplishments from 2014-2019 (MacDonald and Brandt, 2020). The full tables are also archived.

Table 3: Science Products Inventory Additions.

Category	Product	Definition
Data	Scientific discoveries (#)	Number of scientific discoveries resulting from work on the project or project data
Written, Communications	Informal learning/media assets (Y/N)	Presence of reputable informal media coverage and project-led social media outlets
Management & Policy	Broader acceptance of participatory science (Y/N)	Greater acceptance of participatory science as a valuable form of scientific inquiry due to project publications, influence, etc.
Communications	Collaborations and Interdisciplinary Partnerships (Y/N)	Presence of collaboration with communities, organizations, and/or other participatory science projects