Visualize the Impact of Virtualized Museum Collections

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MORPHO SOURCE

Duke UNIVERSITY
Data+

Introduction

What's MorphoSource?
- a **publicly accessible 3D data repository** developed and maintained by Duke University.
- **the 3D files:** represent the world's natural history, cultural heritage, and scientific collections – from primate skulls to historical art pieces.

Why MorphoSource?
- **MorphoSource's core objective:** to share results, increase impact, and improve access to the material vital to scientific discovery and human knowledge growth.

Who uses MorphoSource?
- **Contributors:** museums, researchers
- **Users:** the general public, from K-12 students to artists to postdoctoral researchers, can all view files on MorphoSource.

Most Downloaded Media on MorphoSource
(as of 07/22/2021)

A composite skull of Homo naledi constructed by Prof. Peter Schmid - September 2015 at University of the Witwatersrand.

Objectives

Problem statement:

To continue to digitize fossils and other museum objects, the collections managers, researchers, and others that contribute to MorphoSource need to prove sufficient usage and impact to grant agencies and admin.

Our goal:

Website usage data can provide key evidence for academic and social impact. We aimed to summarize and visualize the raw usage data.

Methods

jupyter

Google Analytics

+ableau

- ✓ Jupyter Notebook + Python for usage statistics analysis (Download times, User intentions, User demographics)
- ✓ Google Analytics for website interaction analysis (Page Views, Total time spent on page)
- ✓ Tableau for data visualization

🏳️‍🌈 Contributor: Project Impact

About section: General Usage Statistics

Power Cascade: 3D models of teeth, claws, horns, thorns, beaks, and shells `Project` `Public`

113 Media · 88 Specimens · Managed by: Alistair Evans, David Hocking

🌐 MEDIA   🗄 SPECIMENS   🖿 ABOUT

DESCRIPTION

The Power Cascade is an evo-devo rule that describes the growth of structures from teeth to shells, such that the radial expansion of the shape follows a power law with the increase in distance.
Publication: Evans et al. (2021). A universal power law for modelling the growth and form of teeth, claws, horns, thorns, beaks, and shells. BMC Biology.

DETAILS

Managed by	Alistair Evans, David Hocking
Creator	Evans, Alistair
Contributors	Rule, James; Cleuren, Silke;

STATISTICS

Number of media	113
Number of represented specimens	88
Number of represented cultural heritage objects	
Project Views	250
Media Downloads	32
Rank in Views	#303 of 629
Rank in Downloads	#334 of 629

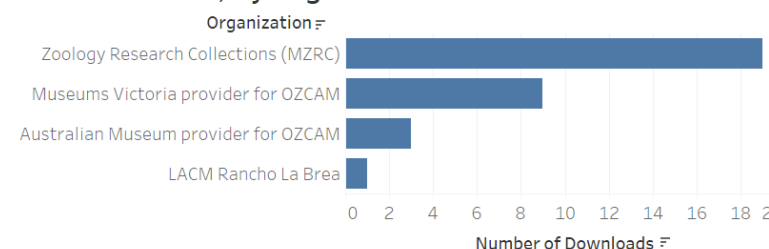### Impact section: Downloads filtered at different levels

🌐 MEDIA   🗄 SPECIMENS   🖿 ABOUT   ⦿ IMPACT

Filter: Organization ▾   Scanning Facility ▾   Specimen/Object ▾

Organization	Downloads
Zoology Research Collections (MZRC)	19
Museums Victoria provider for OZCAM	9
Australian Museum provider for OZCAM	3
LACM Rancho La Brea	1

Total Downloads, by Organization

Filter: Organization ▾   Scanning Facility ▾   Specimen/Object ▾

Object ID	Taxonomy	Downloads
000344032	*Antidorcas marsupialis*	6
000344340	*Loxodonta africana*	4
000343983	*Nautilus pompilius*	3
000344285	*Panthera tigris*	2
000345369	*Canis lupus*	2
...	...	...

PREVIEW

Object ID: 000344032
MZRC:132 *Antidorcas marsupialis*

Object ID: 000344340
nmv:mammalogy:C30765 *Loxodonta africana*

Filter: Organization ▾   Scanning Facility ▾   Specimen/Object ▾

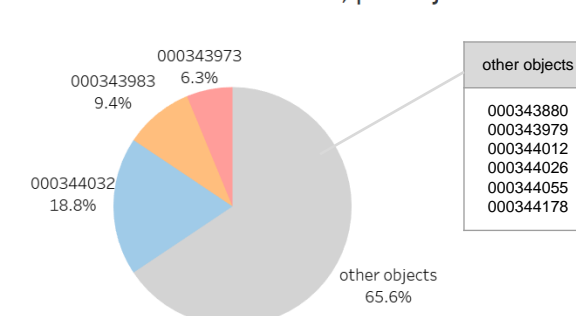| Organization	Scanning Facility	Downloads
Zoology Research Collections (MZRC)	Monash Biomedical Imaging	10
	Evans EvoMorph Laboratory	9
Museums Victoria provider for OZCAM	Justin Adams Laboratory	7
	Evans EvoMorph Laboratory	2
Australian Museum provider for OZCAM	Evans EvoMorph Laboratory	3
LACM Rancho La Brea	Justin Adams Laboratory	1

Total Downloads, by Organization and Scanning Facility
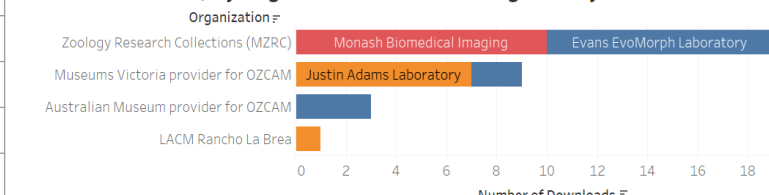
Filter: Organization ▾   Scanning Facility ▾   Specimen/Object ▾

Organization	Object ID	Downloads
	000344032	6
	000343983	3
Zoology Research Collections (MZRC)	000343973	2
	000344006	2
	...	...
...		

Distribution of Downloads, per object

other objects 65.6%
000343973 6.3%
000343983 9.4%
000344032 18.8%

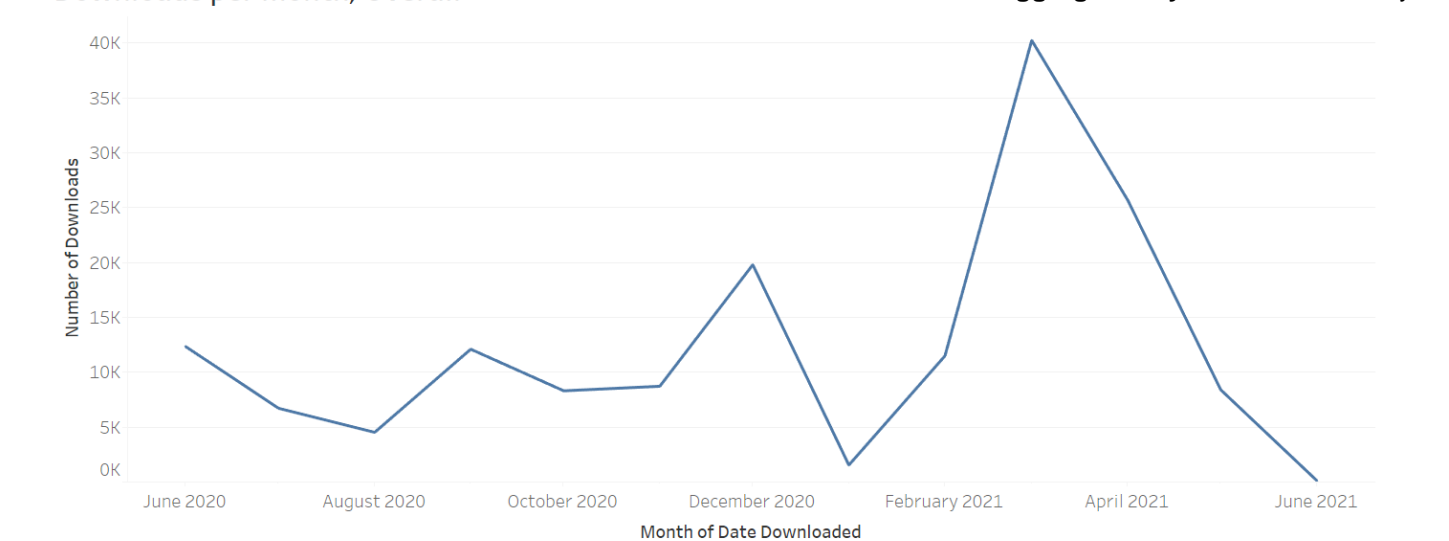other objects: 000343880, 000343979, 000344012, 000344026, 000344055, 000344178

🏳️‍🌈 Contributor: User Dashboard

Welcome Admin! This dashboard provides the impact of your contributions.
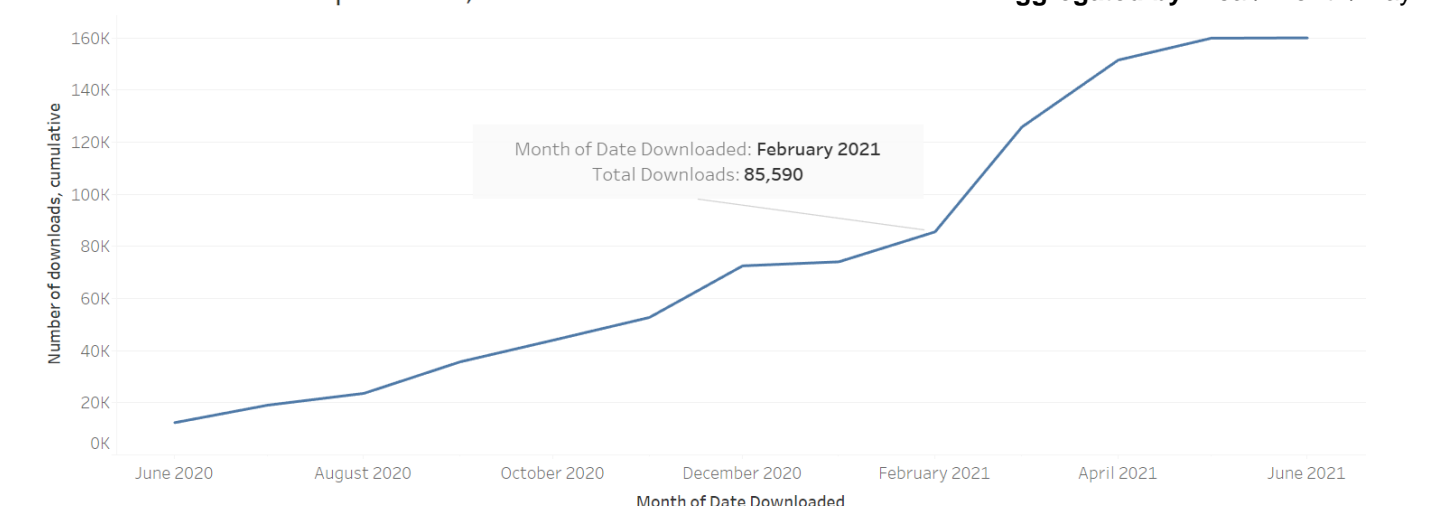
143,562 Media Uploaded - 1,208 Projects Participated
1,467 Unique Users Downloaded - 13,676 Total Downloads

Downloads Overtime, non-cumulative and cumulative
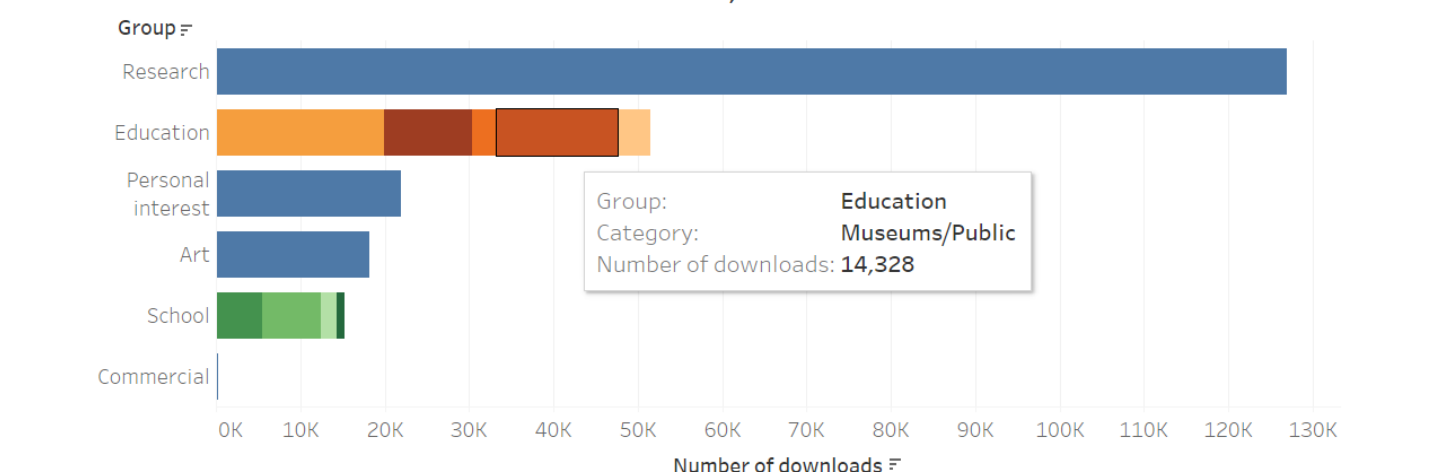
Downloads per month, Overall   Aggregated by: Year/ **Month**/ Day

Cumulative Downloads per month, Overall   Aggregated by: Year/ **Month**/ Day

Month of Date Downloaded: February 2021
Total Downloads: 85,590

User Intentions and User Demographics

Distribution of User Download Intentions, Overall

Group: Research, Education, Personal interest, Art, School, Commercial

Group: Education
Category: Museums/Public
Number of downloads: 14,328

Distribution of User Demographics, Overall

Group	Category
Student	Student (Post-Graduate)
	Student (Grades K-6)
	Student (University or Post-Secondary)
	Student (Grades 7-12)
	PhD student
Researcher	Researcher
Artist	Artist
Faculty	Faculty (University or Post-Secondary)
	Faculty (Post-Graduate)
	Faculty (Grades K-7)
	Faculty (Grades K-6)
	University Staff
Museums	Museum Curator or Collections Manager
	Museum Staff
	Private Individual
DFP Lab, General Educator, Government Employee and 5 more	General Educator
	personal 3d artist
	IT Professional
	Private Industry Professional
	DFP Lab
	Librarian

Group: Faculty
Category: Faculty (Post-Graduate)
Number: 23,094