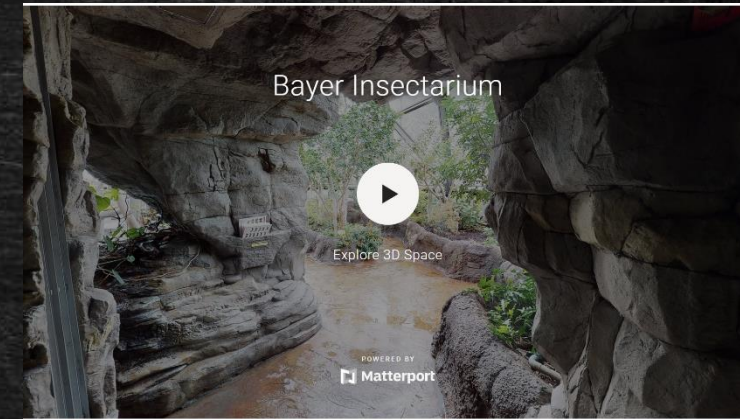
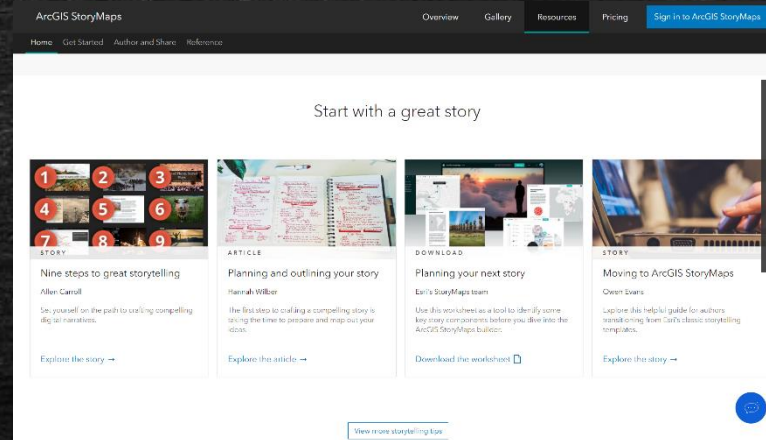
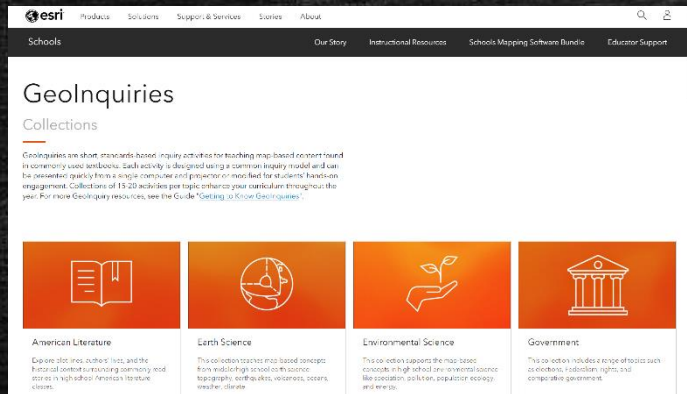




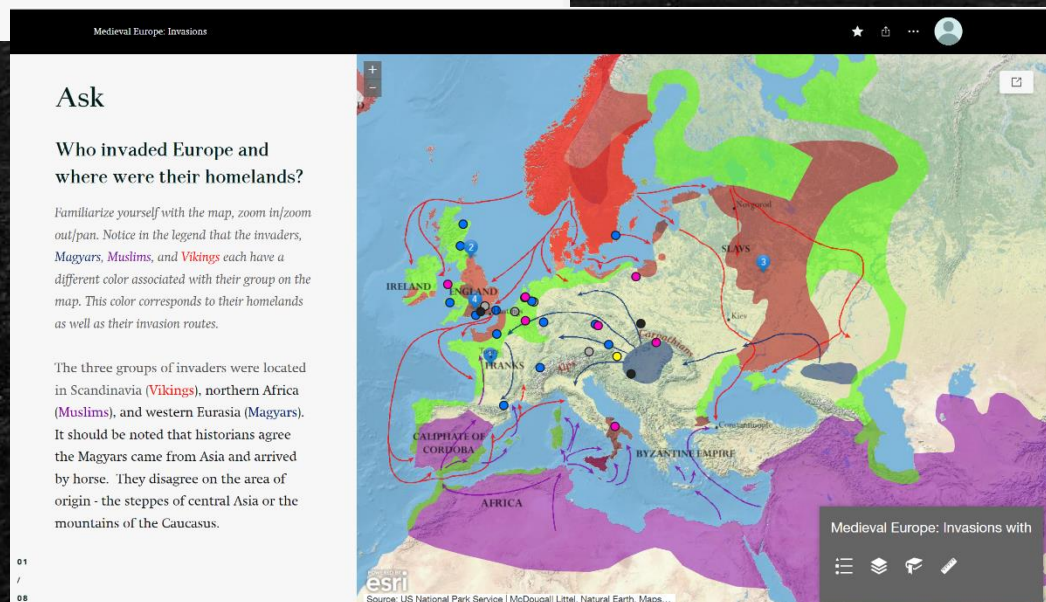
Using Story Maps to Deliver VR Experiences

The Big IDEA

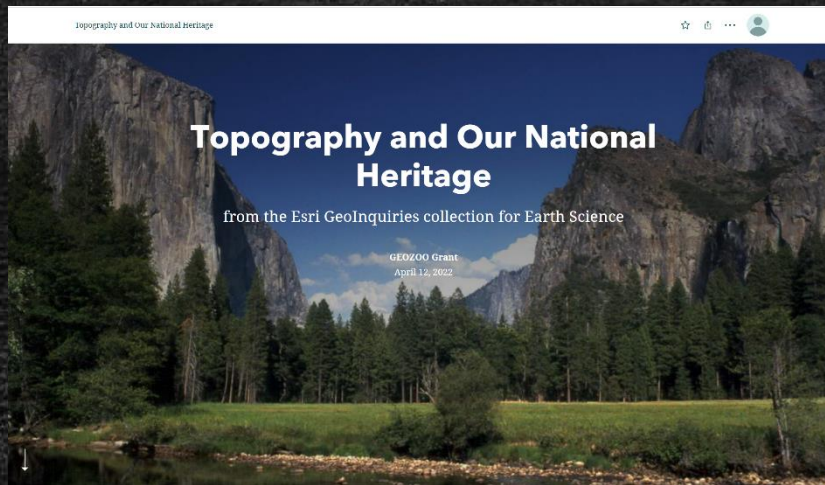


Design for VR a headset

Medieval Europe: Invasions



Topography and Our National Heritage



Engage - How did Yosemite inspire the institution of the National Park System?

This experience is designed to teach you how to interpret landform features using topographic maps, determine distances and scales from a map, and to immerse yourself in the places being represented by the topographic map. Make sure that you remain seated and are in safe environment while participating in this experience.

Why are our National Parks so inspiring? See for yourself...

Click on the Pushpins to the right to view the Virtual Reality Experiences on

01 / 10

Redwood Forest Virtual To...

lines tell us about the landscape?

Half Dome is a large and steep-sided hill referred to as a mountain.

[Zoom to Half Dome](#)

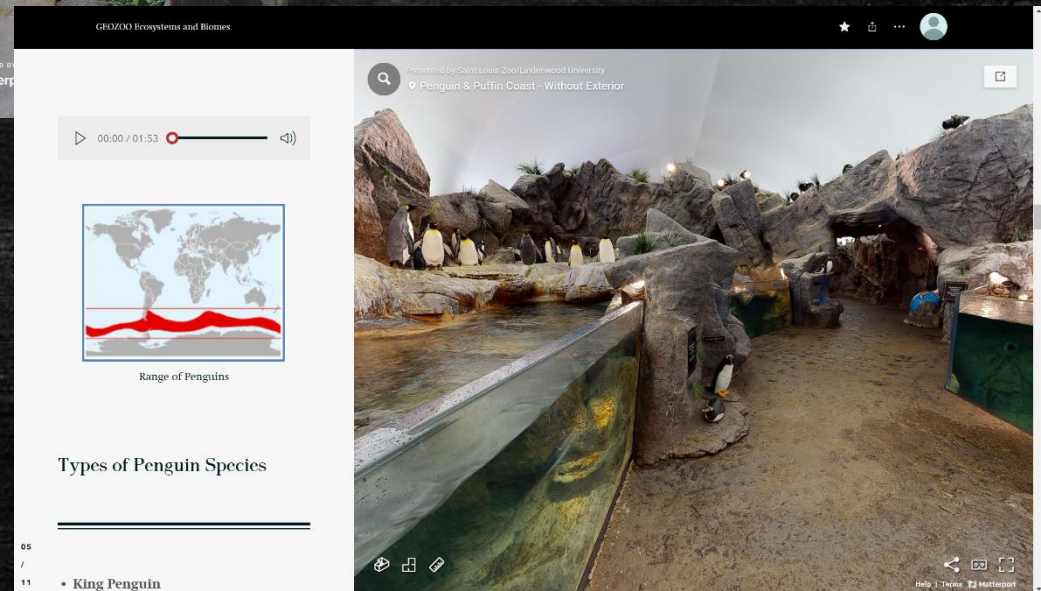
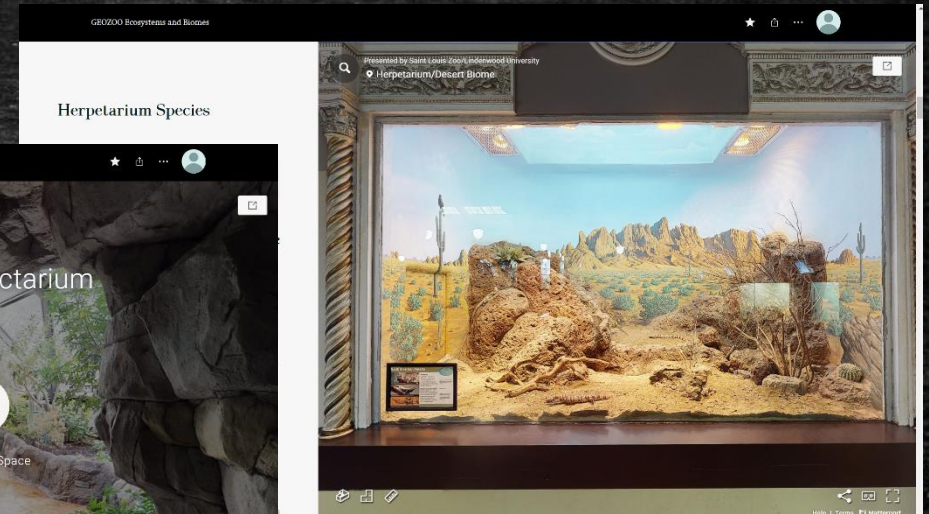
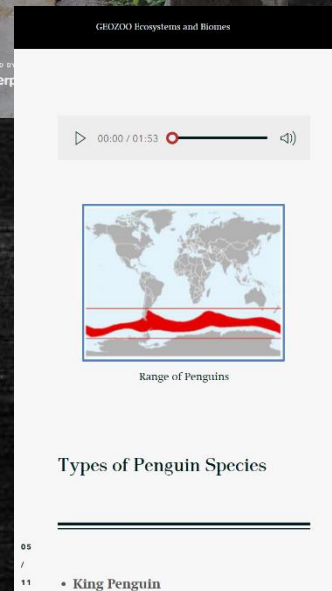
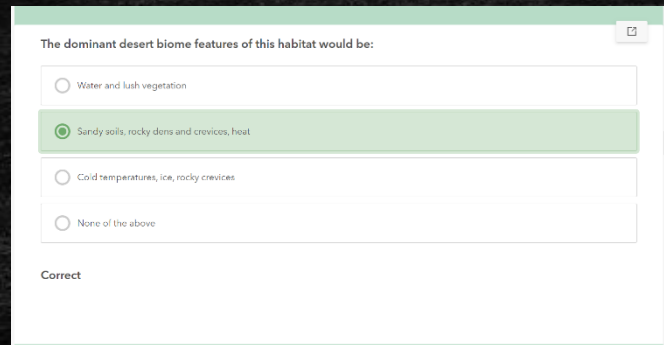
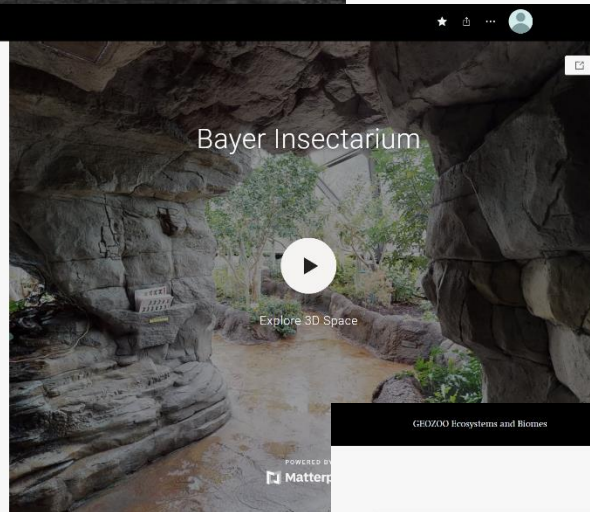
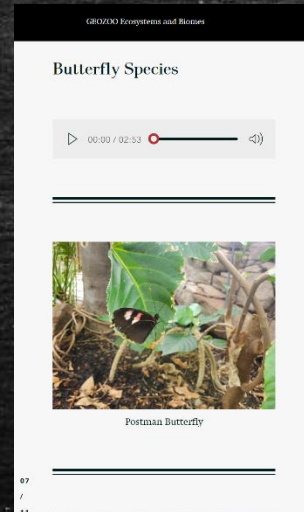
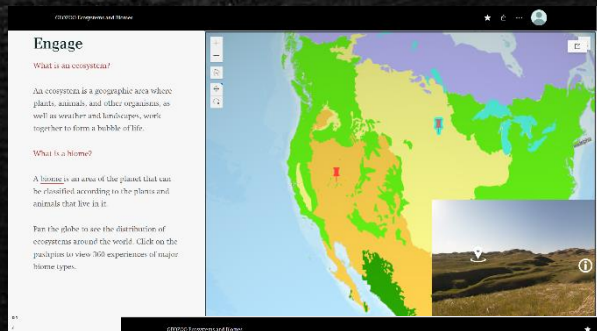
Notice that the topo lines rarely touch or cross, this is because each represents a different elevation and a point can not be at two different elevations, cliffs and overhangs being the exception. Hills and mountains can be identified by the concentric circles or closed figures of the topo (brownish) lines on the map. Half Dome can be identified as a mountain on the map just by looking at the pattern of the topo lines.

What do the smooth brownish parallel lines around the map represent?

- Altitude
- Water
- Elevation
- Temperature

Correct

GEOZOO Ecosystems and Biomes




GEOZOO Community Science

GEOZOO Community Science

GEOZOO Community Science

Emphasis on Wetlands

GEOZOO Grant
April 4, 2022



GEOZOO Community Science

Explore

Take a Closer Look at a Wetland Habitat at the Saint Louis Zoo.

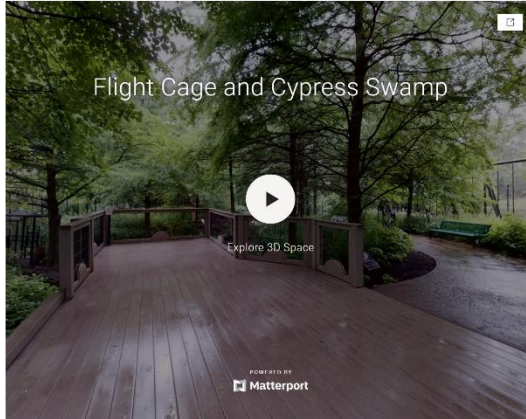
00:00 / 02:07

Listen to this audio before entering the Virtual Reality Experience.

Flight Cage and Cypress Swamp


Explore 3D Space

POWERED BY
Matterport




GEOZOO Community Science

Look for these bird species in the video!

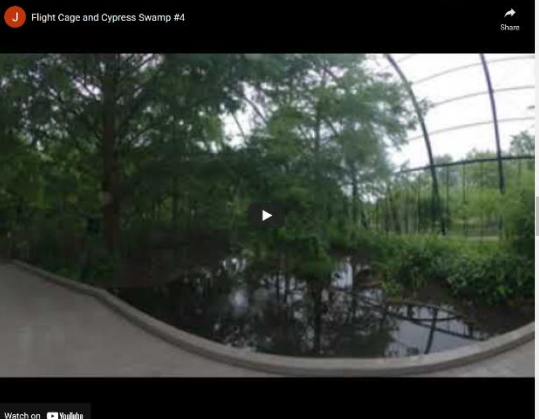


Great Egret



Watch on YouTube


Flight Cage and Cypress Swamp #4



GEOZOO Community Science

Click on the buttons below to zoom to different wetland areas. To get an even more detailed description of each wetland type.

- Estuarine-Click on the Light Green Area
- Lacustrine-Click on the Bright Blue Area
- Marine-Click on the Dark Green Area
- Falustrine-Click on the Brown Area
- Riverine-Click on the Light Blue Area




GEOZOO Community Science

Looking at the Picture, Which Wetland Type Does This Represent?

- Marine
- Riverine
- Lacustrine
- Palustrine

Correct
This is the Mingo National Wildlife Refuge in Southeast Missouri.



GEOZOO Community Science

Act

What exactly is *Community Science* (traditionally referred to as citizen science)?

Community Science projects rely on collaborations between scientists, (paid professionals) and public volunteers (amateurs, naturalists and hobbyists). These collaborations could include any level of participation, from being purely observational, to being more hands-on.

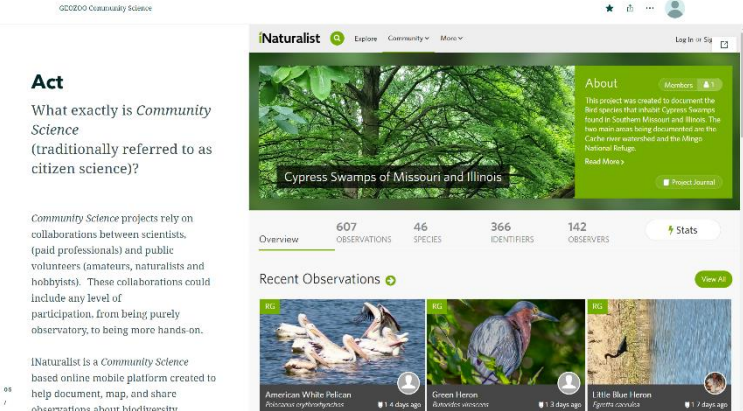
iNaturalist is a *Community Science* based online mobile platform created to help document, map, and share observations about biodiversity.

iNaturalist

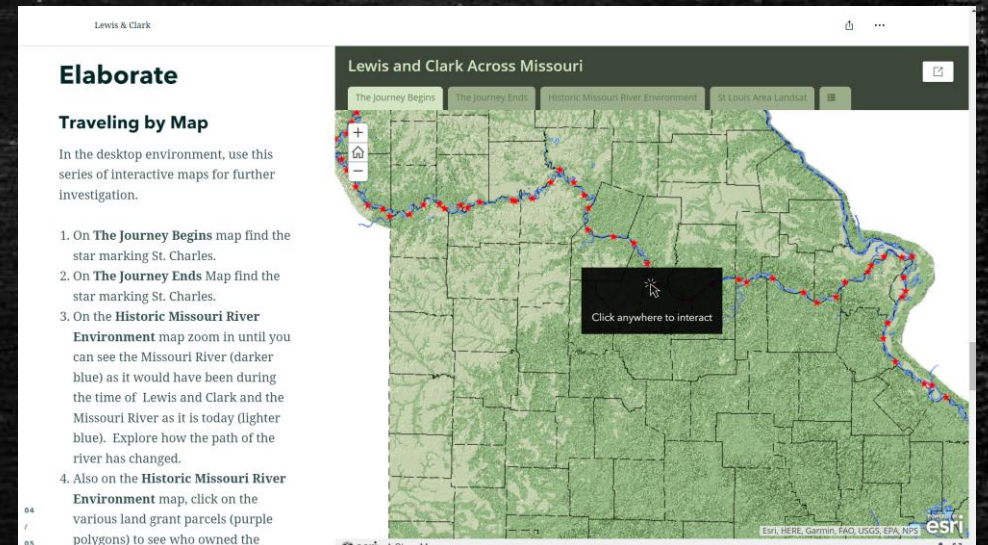
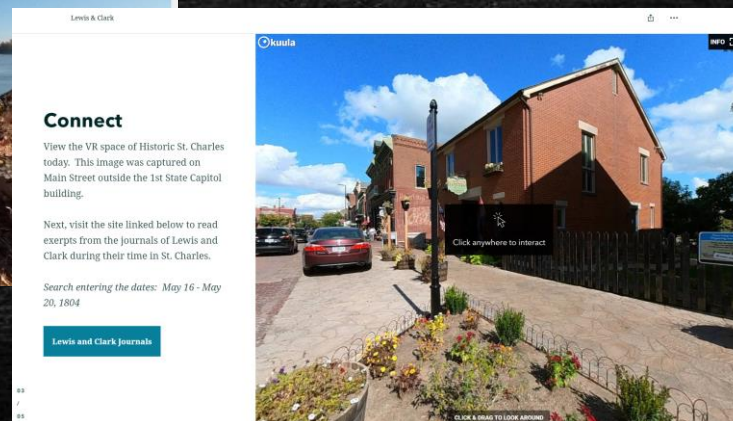
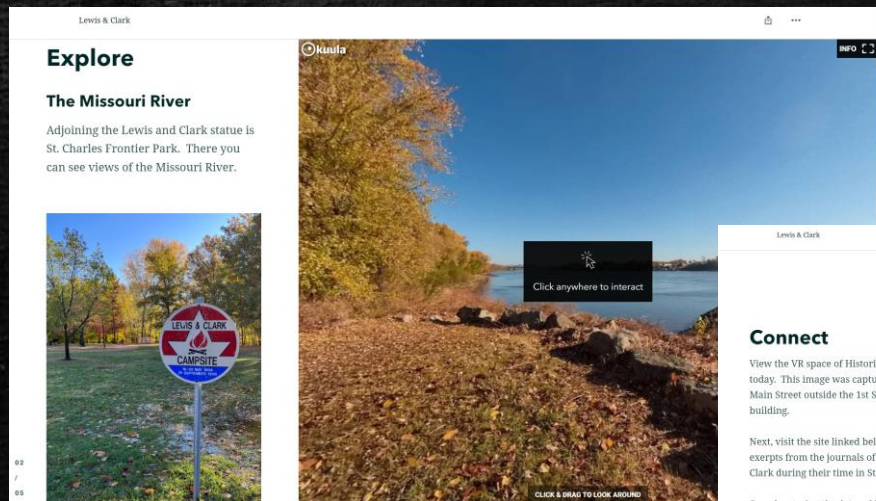
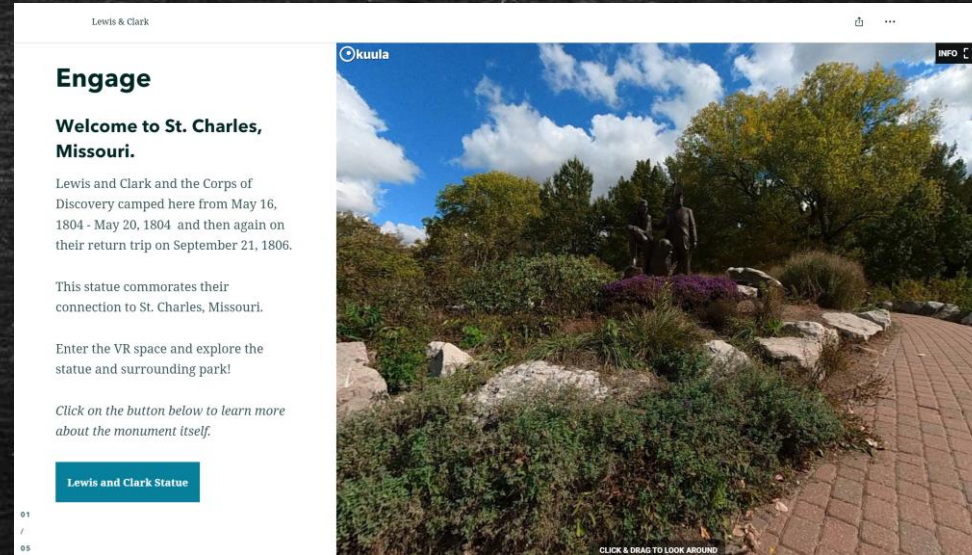
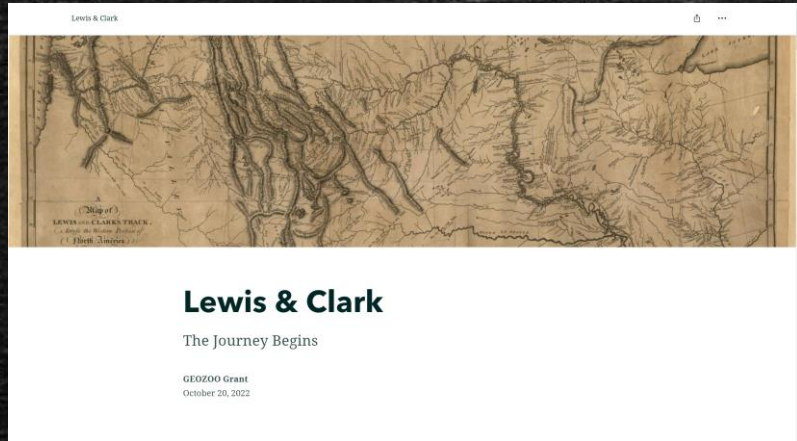
607 OBSERVATIONS 46 SPECIES 366 IDENTIFIERS 142 OBSERVERS

Recent Observations

- American White Pelican *Pelecanus erythrorhynchos* 1.4 days ago
- Green Heron *Butorides virescens* 3.3 days ago
- Little Blue Heron *Egretta caerulea* 1.7 days ago



Lewis and Clark: The Journey Begins



360 Capture Devices

- Smart Phone – VR Photosphere
 - [Google Street View](#)
 - [Matterport Capture](#)
- [Insta360 One X2](#) – 360 Photo
- [GoPro Max](#) – 360 Video
- [Matterport](#) – 360 Scan
- Hosting Spaces
 - [Kuula](#)
 - [Momento360](#)

Oculus/Meta Logistics

- The hardware/software on the devices are constantly updated making extra planning a necessity before use
- No longer need a Facebook account, but you must now establish a [Meta account and Horizon Profile](#)
- An institutional account system is in beta, but currently there is an issue with a one-to-one device need (one headset to tablet or desktop) for hardware set-up

Because Story Maps run on the browser, any VR device with a browser should be able to access the published Story Map.

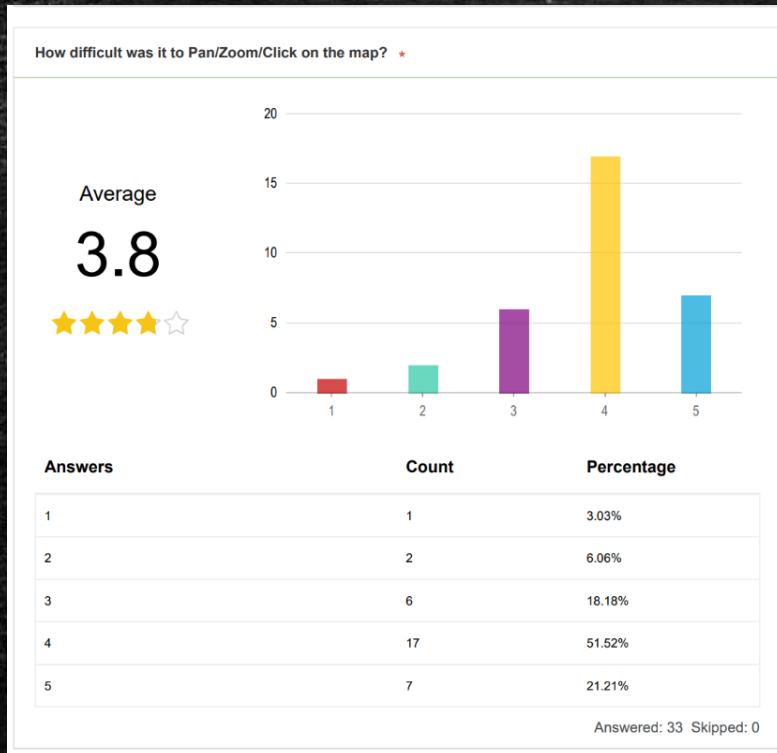
Learning with Oculus/Meta

- 33 Zoo campers evaluated the GEOZOO activities
 - 17 using the headsets
 - 16 using a laptop and mouse
- Some of the Comments from Campers
 - “It was really cool just a little difficult to move around.”
 - “It was much better than typical schoolwork hopefully we’ll get to use it more”
 - “It was kinda hard to move through the map thing so maybe fix that”
 - “More places to “walk”around”
 - “i dont have any complaint but it really didn't interest me much”
 - “have more maps we can explore.”
 - “I really enjoyed the Story map and Geoinquiry I think that you should add more options for places you can go and work on adding more information.”

How Difficult was it to Pan/Zoom/Click on the Map?

5 = Extremely Easy 1 = Extremely Difficult

Combined Average



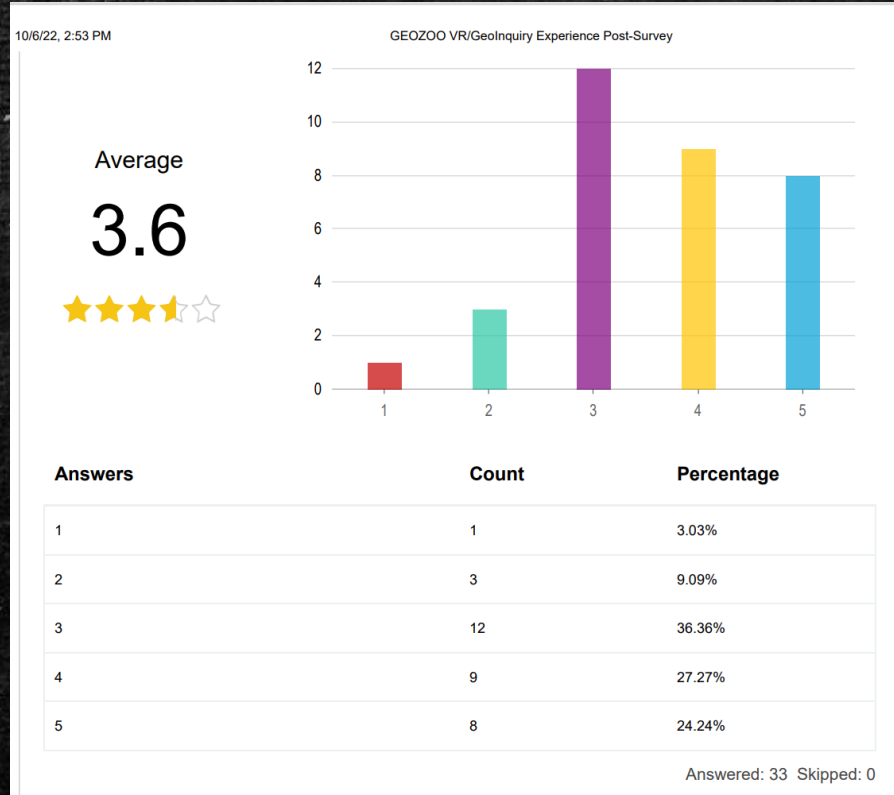
Differences between Devices

- Headset
 - Lowest scores were given by students using the headset
 - 1 camper gave a rating of 1
 - 2 campers gave a ratings of 2
 - 4 campers gave ratings of 3
- Laptop with mouse
 - 2 campers gave ratings of 3
 - 8 campers gave ratings of 4
 - 6 campers gave ratings of 5

How Difficult was it to toggle between the Story Map and Matterport 3D experience?

5 = Extremely Easy 1 = Extremely Difficult

Combined Average



Differences between Devices

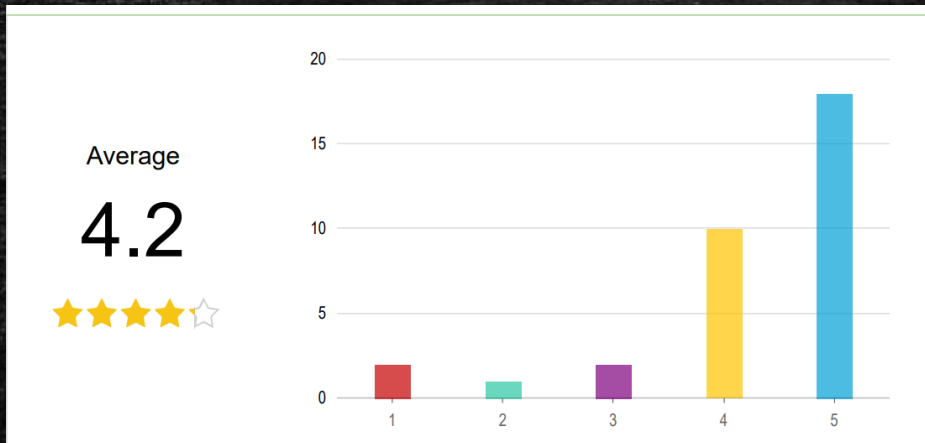
- Headset
 - Again, produced the lowest scores
 - Only 3 campers gave ratings of 5
 - 3 campers gave ratings of 4
 - 11 campers gave ratings of 3 or less
- Laptop with mouse
 - No ratings under 3

- Headset
 - "A little bit more information on how to move around."
 - "Possibly less switching between tabs"
 - "To move around the 3D spaces it sometimes took a couple of clicks or didn't click at all."
 - "Maybe make a key on what buttons equals what"

This is where the tech just isn't quite there yet.

Would you like to see more experiences like the GEOZOO lessons integrated into your regular coursework at school?

Combined Average



Answers	Count	Percentage
1	2	6.06%
2	1	3.03%
3	2	6.06%
4	10	30.3%
5	18	54.55%

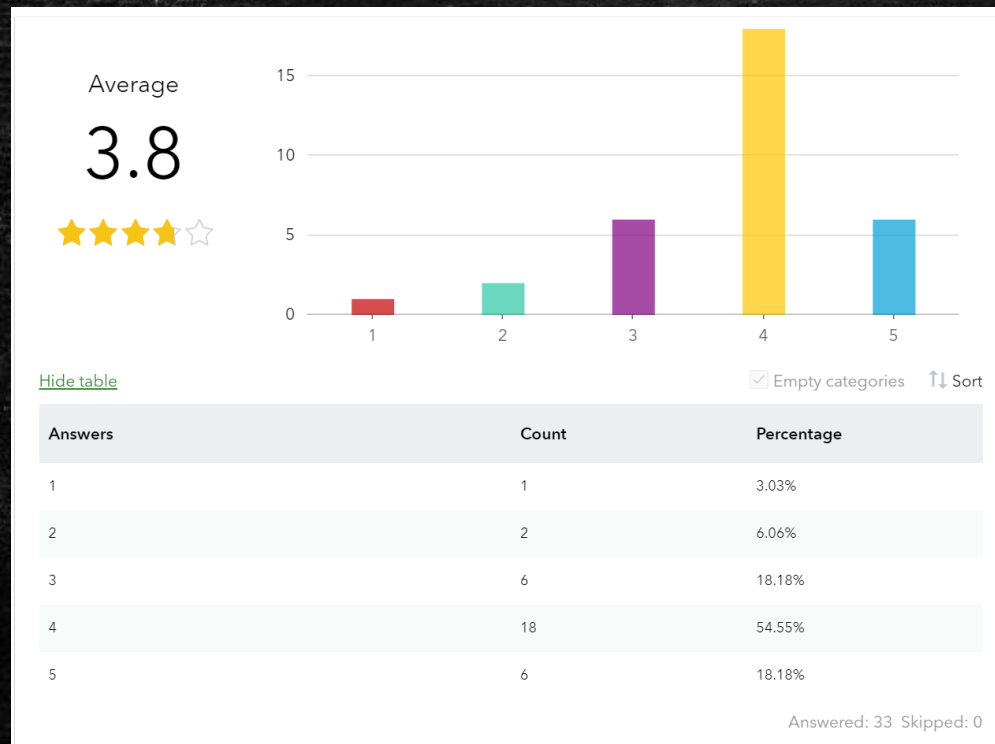
Answered: 33 Skipped: 0

Differences between devices

- Headset
 - 1 rating of 1
 - 1 rating of 2
 - 2 ratings of 3
- Laptop with mouse
 - 1 rating of 1
 - 5 ratings of 4
 - 10 ratings of 5

After finishing the first GEOZOO Story Map Geoinquiry how excited were you to start and complete the second experience?

Combined Average

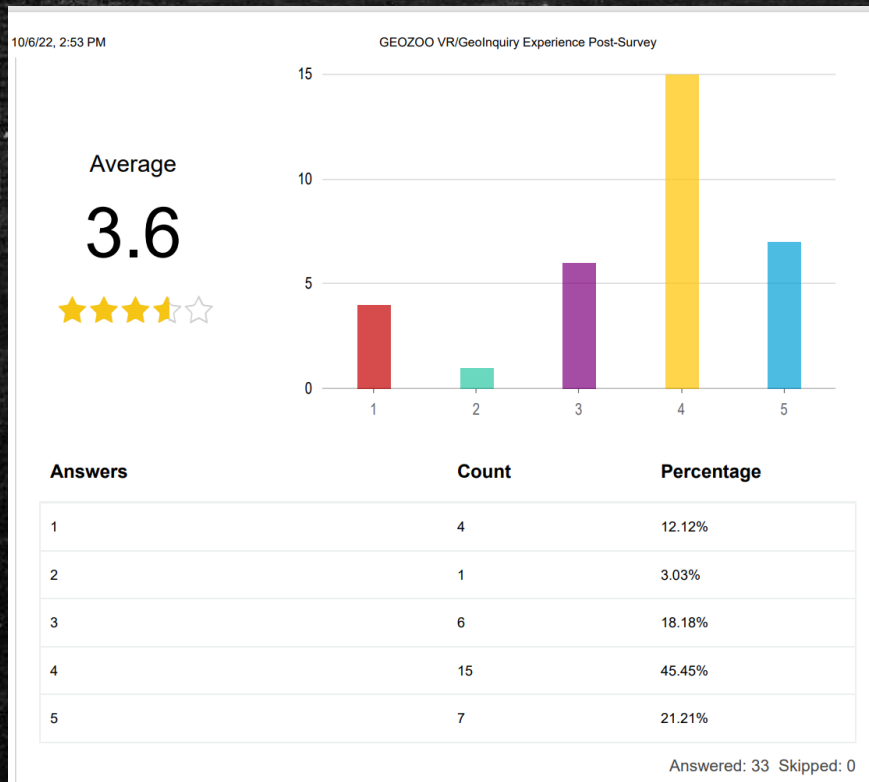


Differences between Devices

- Headset
 - 1 rating of 1
 - 1 rating of 2
 - 2 ratings of 3
 - 5 ratings of 4
 - 8 ratings of 5
- Laptop with mouse
 - 1 rating of 2
 - 4 ratings of 3
 - 7 ratings of 4
 - 4 ratings of 5

Did you feel like you were in the habitats at the zoo?

Combined Average



Differences between Devices

- Headset
 - 2 ratings of 1
 - 6 ratings of 3
 - 8 ratings of 4
 - 1 ratings of 5
- Laptop with mouse
 - 2 ratings of 2
 - 1 ratings of 2
 - 7 ratings of 4
 - 6 ratings of 5

The Big Lessons Learned

1. *A lot* can be done with GIS/VR out of the box!
2. The technology is moving in the right direction but is still clunky to maneuver between the two formats.
3. As of now, maneuvering the map and running any kind of GIS analysis still works best on the desktop.
4. Story Maps are the star of the show – They do what Story Maps do best – Bring together resources not considered before and make them accessible to users through various hardware formats (headset and desktop) because the software it is browser based!
5. Data collected from the camps points toward the need for a more seamless integration – this will probably need to be achieved by gamifying the lessons using game engine software

Accessibility

Workforce
Development

Teaching Tech

Teaching Place

https://digitalcommons.lindenwood.edu/gis_oer/

The screenshot shows a web browser window with the URL https://digitalcommons.lindenwood.edu/gis_oer/. The browser's address bar and tabs are visible at the top. The website header features the Lindenwood University logo and a large banner image of the Library & Academic Resources Center building with the text "DIGITAL COMMONS @ LINDENWOOD UNIVERSITY". Below the banner is a navigation menu with links for HOME, ABOUT, FAQ, and MY ACCOUNT. The main content area is titled "GEOSPATIAL OER" and includes a "Follow" button. A list of "Submissions from 2022" is displayed, with each entry including a link icon, the title, and the authors' names.

LINDENWOOD UNIVERSITY

DIGITAL COMMONS @ LINDENWOOD UNIVERSITY

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Home > INNOVATION-SPACE > Geospatial Education and Tech > GIS_OER

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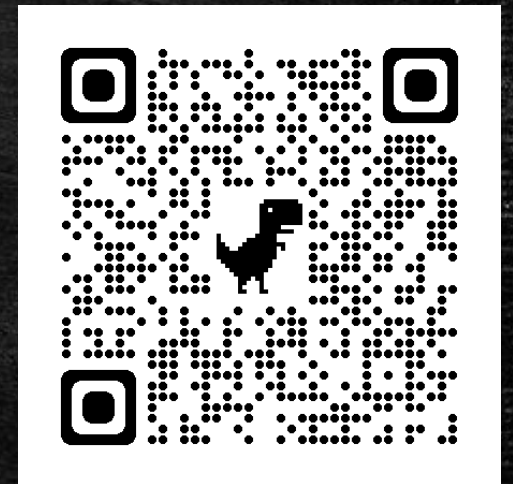
Author Corner

[Author FAQ](#)

Submissions from 2022

- [Link](#) [GEOZOO Community Science – Emphasis on Wetlands](#), Tara Vansell, Keegan Favors, and Michael Dawson
- [Link](#) [GEOZOO Ecosystems and Biomes](#), Tara Vansell, Keegan Favors, and Michael Dawson
- [Link](#) [Lewis and Clark: The Journey Begins](#), Tara Vansell and Keegan Favors
- [Link](#) [Medieval Europe: Invasions](#), Tara Vansell and Keegan Favors
- [Link](#) [Topography and Our National Heritage](#), Tara Vansell and Keegan Favors

All activities can be found at Lindenwood Digital Commons > Innovation Space > Geospatial Education and Tech



What's Next...

World Regional Geography (hyflex modality) – VR Field Trips – Keeping it a Treat

- ✓ Assignment possibilities – Create an Amazing Race Story Map using VR content

Incorporating how to work the cameras/capture and share images into Advanced GIS

Advice on getting started (My 2 cents)...

Less is More

Get a handful of headsets for students to use for individual enrichment

Teleport using VR to increase engagement, THEN
Collectively work together on traditional devices to do the GIS

Design for device and deliver using Story Maps, browser based –
Again, the headsets are just computers you are wearing on your face!

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