DIGITAL MAPPING TECHNIQUES 2024 LITE 2

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ADAPTING TO A CHANGING WEB ENVIRONMENT

Ohio Geological Survey's Migration to Experience Builder for the Ohio Karst Interactive Map

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Photo Credit: Douglas Aden and Brittany Parrick

- My name is Jason Piwarski and I work with the Ohio Division of Geological Survey as a GIS Database Administrator here in Columbus, OH.
- My presentation today is called "Adapting to a Changing Web Environment" and I'm going to talk about Ohio Geological Survey's work to update their interactive maps to Experience Builder, with the Ohio Karst Interactive Map being the first we've completed the transition for

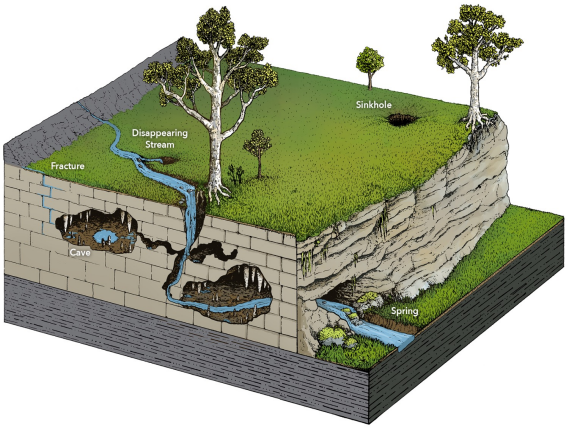
BACKGROUND

WHAT IS KARST?

Karst terrains are regions that contain sinkholes and other solutional features, such as caves, springs, disappearing streams, and enlarged fractures. Sinkholes are the main hazard associated with karst landforms in Ohio, and there are thousands of them in the state. Sinkholes form as bedrock dissolves and surface materials erode or collapse into the resulting voids.

Source: Aden, D. (2024). *GeoFacts 31: Ohio Karst.* https://dam.assets.ohio.gov/image/upload/ohiodnr.gov/documents/geology/GF31_Aden_2024.pdf

BLOCK DIAGRAM SHOWING THE RELATIONSHIPS BETWEEN KARST FEATURES. ILLUSTRATION BY MADISON PERRY.



First, just a quick bit of background if you don't know what karst means. Karst basically refers to water dissolved features in bedrock and the karst interactive map for Ohio maps where these karst features can be found, such as the locations of sinkholes or springs, of which there are thousands of within Ohio.

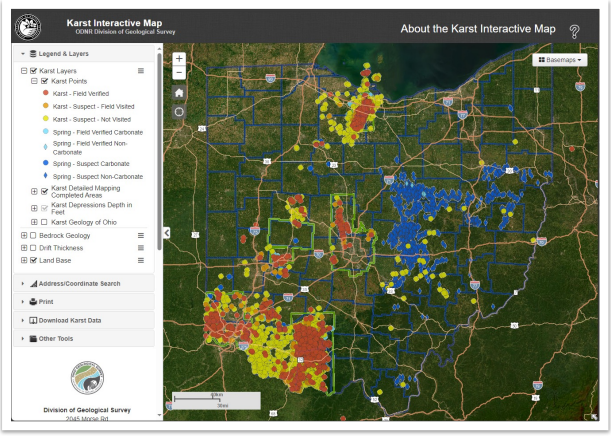
Just to further explain what karst means, here's an example of a sinkhole that formed in a farmer's pasture.

BACKGROUND CONTINUED

Ohio Geological Survey has web maps available for general geological data and specific datasets, **including karst locations, which is the focus of this talk.**

Since the late 2010s, Ohio Department of Natural Resources has been using *ArcGIS API for JavaScript version 3* for interactive maps, including Karst Interactive Map.

In July 2024, ESRI stopped supporting the API, leaving the door open to potential security vulnerabilities and loss of website functionality.



The former Ohio Karst Interactive Map interface.

- Since the late 2010s, Ohio Geological Survey has produced several interactive maps on various topics, such as earthquakes or karst locations
- All of these interactive maps were built using version 3 of the ArcGIS Javascript API, which ESRI stopped supporting in July earlier this year. The maps still work, but our state IT security team started flagging them for potential vulnerabilities and asked for us to come up with a solution.
- To give a broader context to this issue as well, Ohio Department of Natural Resources, of which Ohio Geological Survey is part of, has 18 interactive maps built with the retired API, so we needed to come up with a plan to support these maps going forward and needed to explore our options considering how much work would need to be done (next slide)

WHAT DO WE DO?!

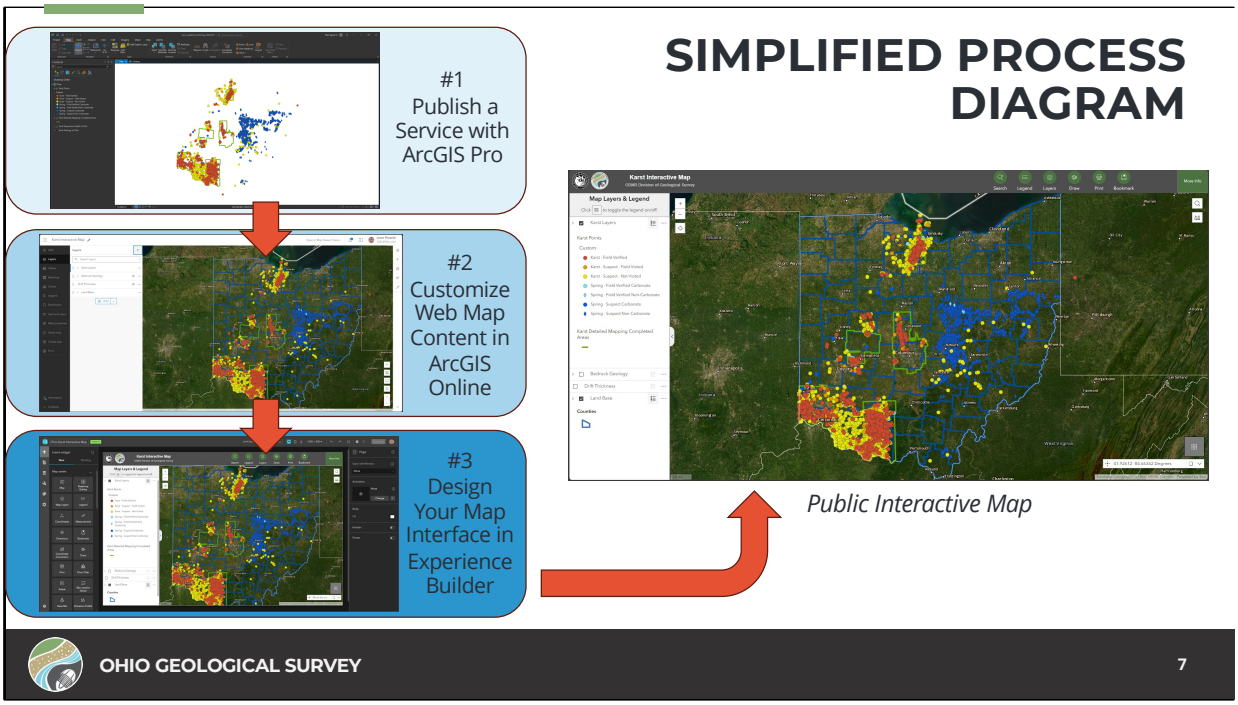
- Rewrite all the code in version 4 of the API?

- Use ArcGIS Online using Experience Builder?

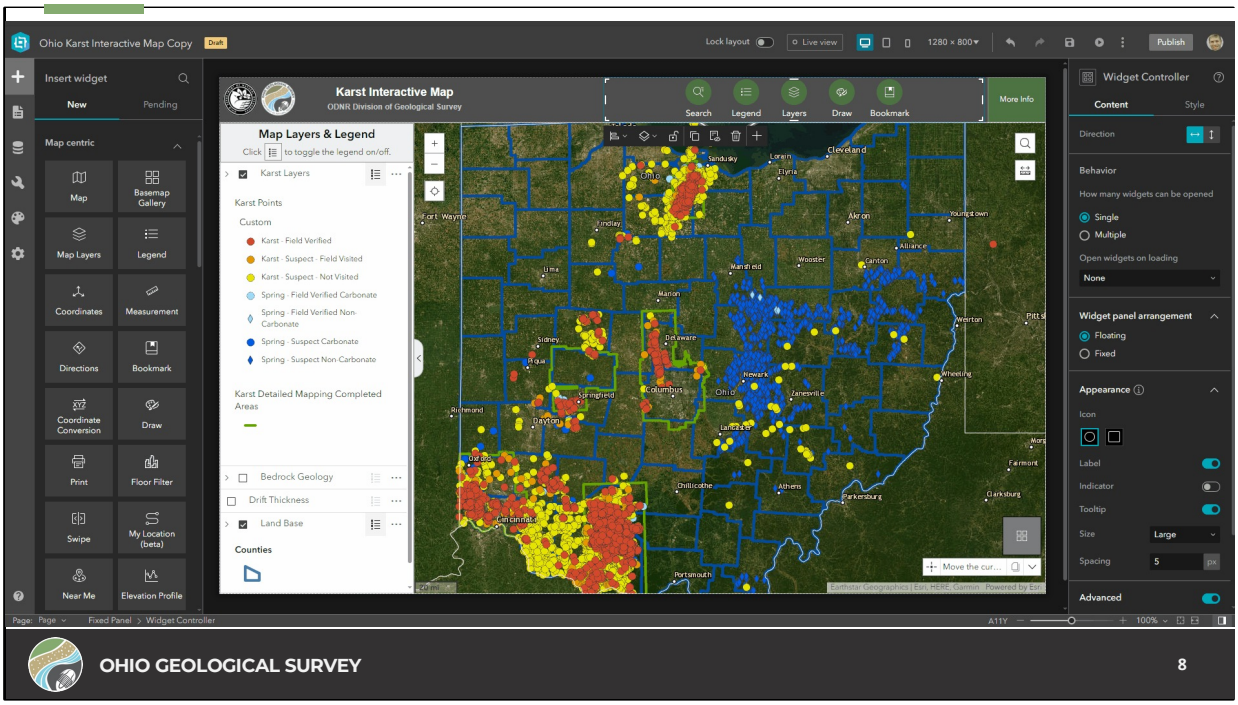
WINNER - EXPERIENCE BUILDER ON ARCGIS ONLINE

- Development done through online GUI and website hosted on ArcGIS Online. ArcGIS Online also allows for adding already created map services. **No coding required**. **This is a major time-saver.**
- All of the previous tools/widgets that were in the older version of the interactive map are available in Experience Builder.
- Backend coding updates for the interface are taken care of by ESRI, so less maintenance in the long-run as well.
- Responsive web-design built-in with Experience Builder.
- One negative – it does have bugs!

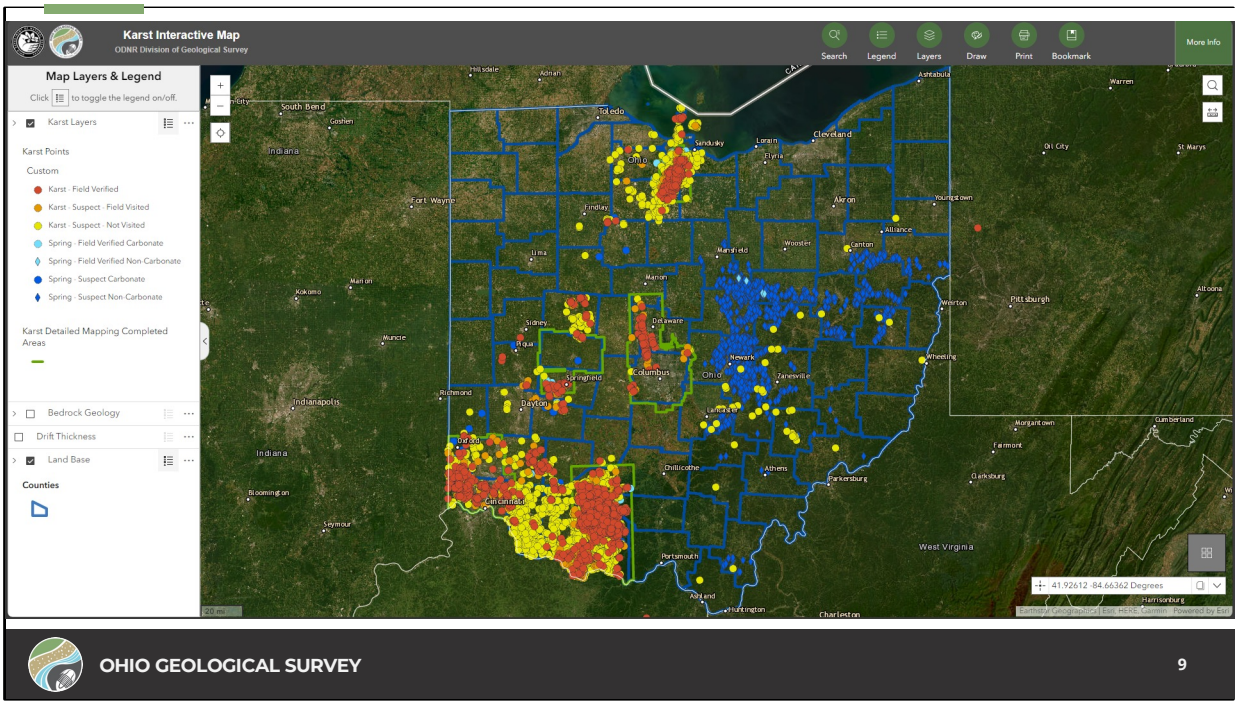
- We decided to go with Experience Builder
- Development done with GUI and this saves Ohio DNR a lot of time, especially with all maps that need to be upgraded.
- All of the functionality in the previous interactive maps was preserved, although not everything is there yet in EB vs. the version 4 of the Javascript API.
- ESRI takes care of maintenance with incremental library/version updates.
- Responsive web design much easier compared to our older interactive maps, which weren't responsive.



- Here's a general overview of the process we used for creating the new interactive maps in Experience Builder (go through steps).



Here's an example of how you can use the web browser interface to create the interactive map and add functionality. In this example, I'm adding a print button that people can use to create PDFs of the web map to print or just keep as records. It's as simple as drag and drop!



Here's what the final Experience Builder interface looks like.

https://experience.arcgis.com/experience/6d213b0fdd764b2395ac3998905c7afe/

IMPORTANT ADDITIONAL INFORMATION

- Ohio Department of Natural Resources (ODNR) stores all production datasets in ArcGIS Enterprise SDE on Microsoft SQL Server.
  - This setup allows for select users to edit datasets and then have those edits automatically appear in interactive maps.
- All web services are published to Portal from ArcGIS Server hosted on AWS.
- ODNR pays ESRI for licenses to create web applications hosted on ArcGIS Online.

- Having a well-designed GIS architecture in place made this transition much easier. Also management that's willing to budget for the cost!
- At ODNR, we store all production GIS datasets in ArcGIS Enterprise SDE, which allows for multiple users to edit the same dataset, while also preventing others from editing. These feature classes are then used in the map services that are served to the interactive maps we're creating on Experience Builder.
- We do pay for licenses to have access to an ArcGIS Online Organization account, which allows us to host the interactive maps on ESRI servers.
- Previously, we did more of the work ourselves and it was a headache with having to fix things that would periodically break. Plus, we're not always well-trained to solve some of the issues we would encounter.

WHO IS OUR AUDIENCE?

- General public wanting to know more about the geology in their location.
- Professionals doing environment reviews for future projects.
- Organizations tasked with protecting groundwater supplies from surface pollutants.

Finally, in preparing this presentation, I was asked to talk about who is the audience for our interactive maps and from what I've gathered, it's the following…

WHAT'S NEXT?

1. Update remaining interactive maps to Experience Builder:
   - *Ohio Earthquakes Interactive Map*
   - *Ohio Geology Interactive Map*
2. Complete setup of an ArcGIS Hub website to provide the public access to downloading data and viewing metadata.

What's next? Currently working on migrating remaining interactive maps to Experience Builder and migrating from our old data download/metadata website, based on Access and ASP, to an ArcGIS Hub website that the public will be able to access.

THANK YOU!

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Ohio Karst Interactive Map
URL: https://ohiodnr.gov/discover-and-learn/safety-conservation/geologic-hazards/karst

Special thanks to Douglas Aden, Brittany Parrick, Andy Nash, J.D. Stucker, and Joe Wells for input on the design of the interactive map.

Thank you! You can see my contact information on the screen and I would like to give thanks to *Douglas Aden, Brittany Parrick, Andy Nash, J.D. Stucker, and Joe Wells* for advice in creating the new Experience Builder website.