

Geographic Information Systems and Video Games: A New Paradigm for Geographic Visualization and Interaction

Brian Tomaszewski, Ph.D.

Associate Professor

Center for Geographic Information Science and Technology
School of Interactive Games and Media
Rochester Institute of Technology, USA

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INFORMATION
SCIENCE & TECHNOLOGY

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Golisano College of
Computing and
Information Sciences
**School of
Interactive Games
and Media**

Outline

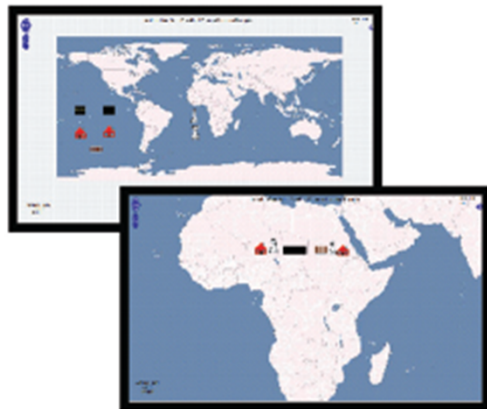
- Background: GIS and Games
- Using GIS tools for Games (ArcGIS Pro 3D and City Engine)
- ArcGIS Maps SDK for Game Engines
- Unity
- Unity and ArcGIS Maps SDK for Game Engines
- Demo: Project Lake Ontario
- Where to go from here?



Risk

N. America	5	Asia	7
S. America	2	Europe	5
Africa	3	Australia	2

Background:
GIS and Games



a)



b)



c)



Figure 1 Three prototype implementations of key GeoGame concepts

Ahlqvist, O., et al. (2012).
 "Geospatial Human-environment
 Simulation through Integration of
 Massive Multiplayer Online
 Games and Geographic
 Information Systems."
Transactions in GIS 16(3): 331-
 350.

Background: GIS and Games

Games often have a *spatial* component



Pokémon Go, an Augmented Reality Geo-game.

<https://theconversation.com/why-pokemon-go-became-an-instant-phenomenon-62412>

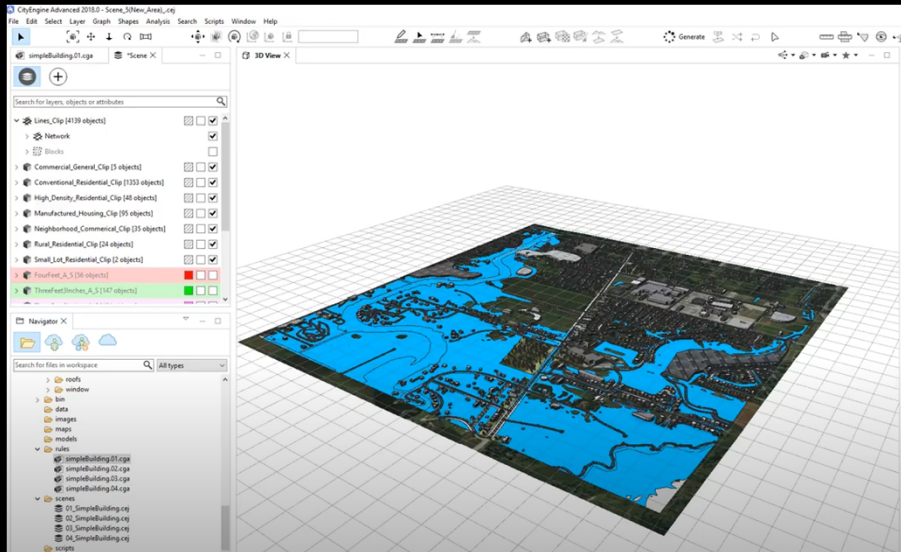
CC BY 4.0 -

<https://creativecommons.org/licenses/by/4.0/>

What's different now?

- Real-world data as the basis for games – AR
- Direct incorporation of geospatial data into game development platforms

Using GIS tools for Games (City Engine)

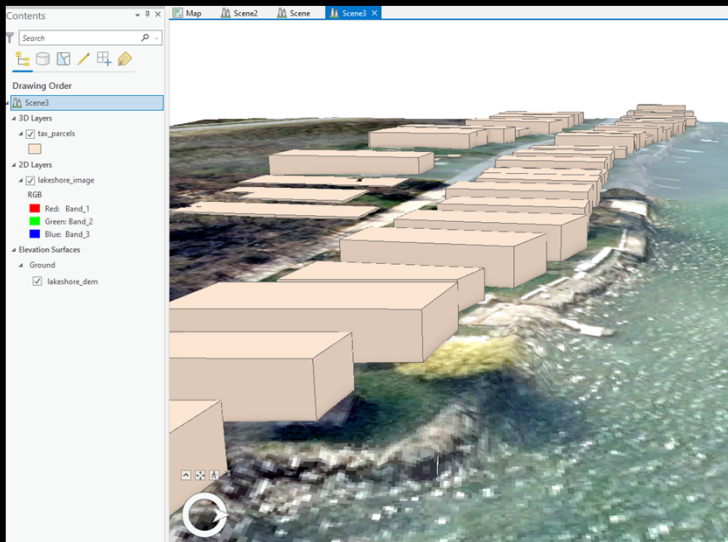


<https://www.youtube.com/watch?v=WQv6Bw1P72E>

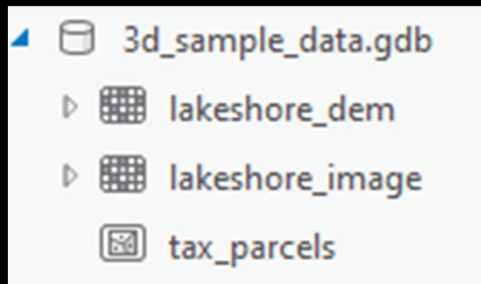
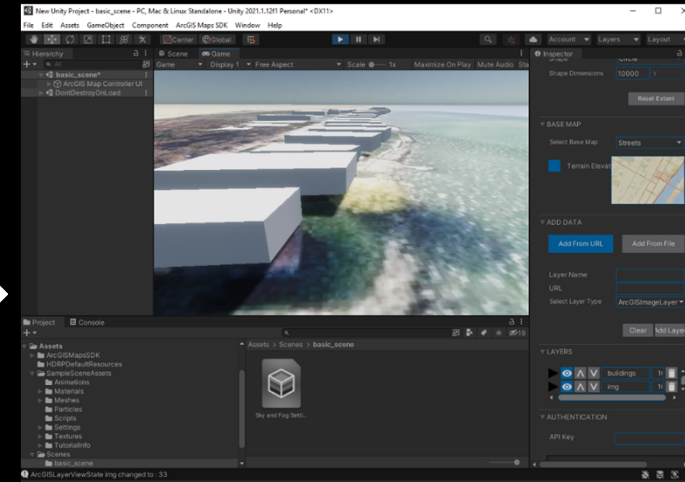


US National Science Foundation and the project REU Site: Geographic Information Systems (GIS) for Disaster Resilience Spatial Thinking (NSF SBE - 1659735)

Using GIS tools for Games (ArcGIS Pro 3D)



Title		
org_tax_spc	Scene Layer (hosted)	
org_tax_spc	Scene Layer Package	
lakeshore_image	Tile Layer (hosted)	
lakeshore_image	Service Definition	



Prepare 3D datasets in ArcGIS Pro

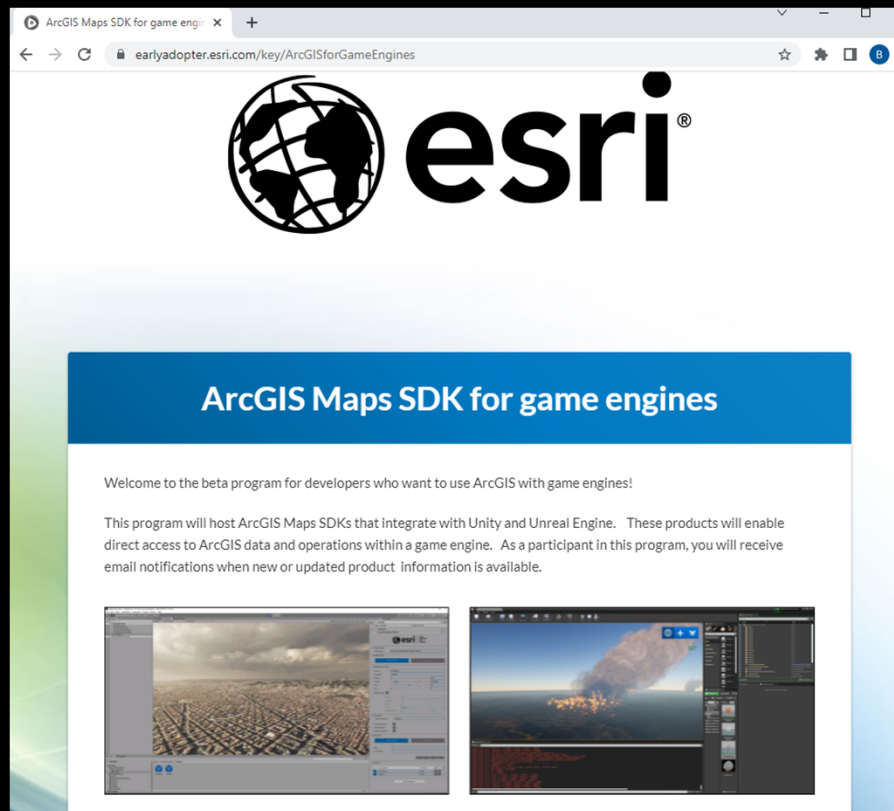


3D datasets published to ArcGIS Online



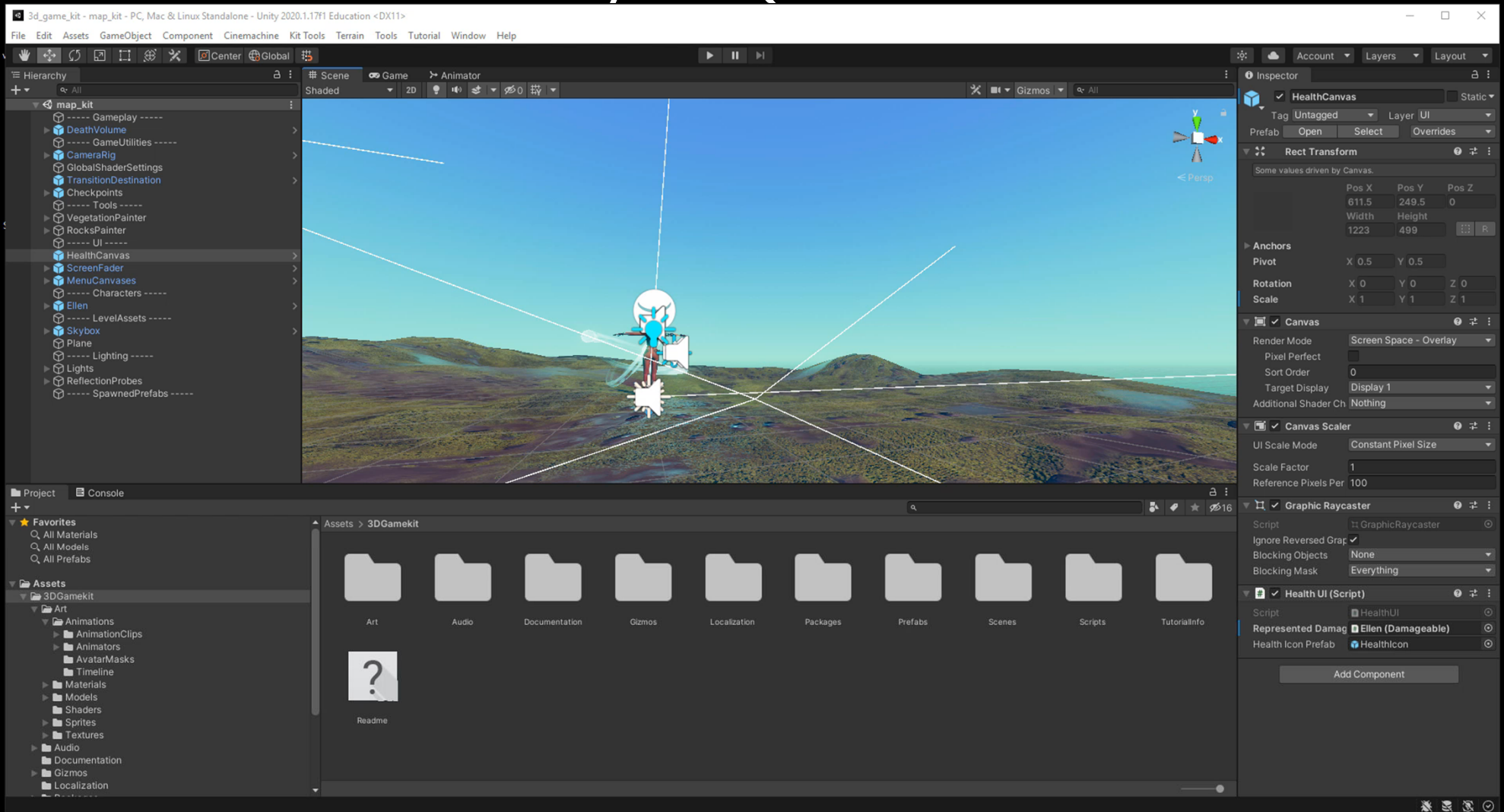
ArcGIS Online 3D datasets incorporated into Unity

ArcGIS Maps SDK for game engines



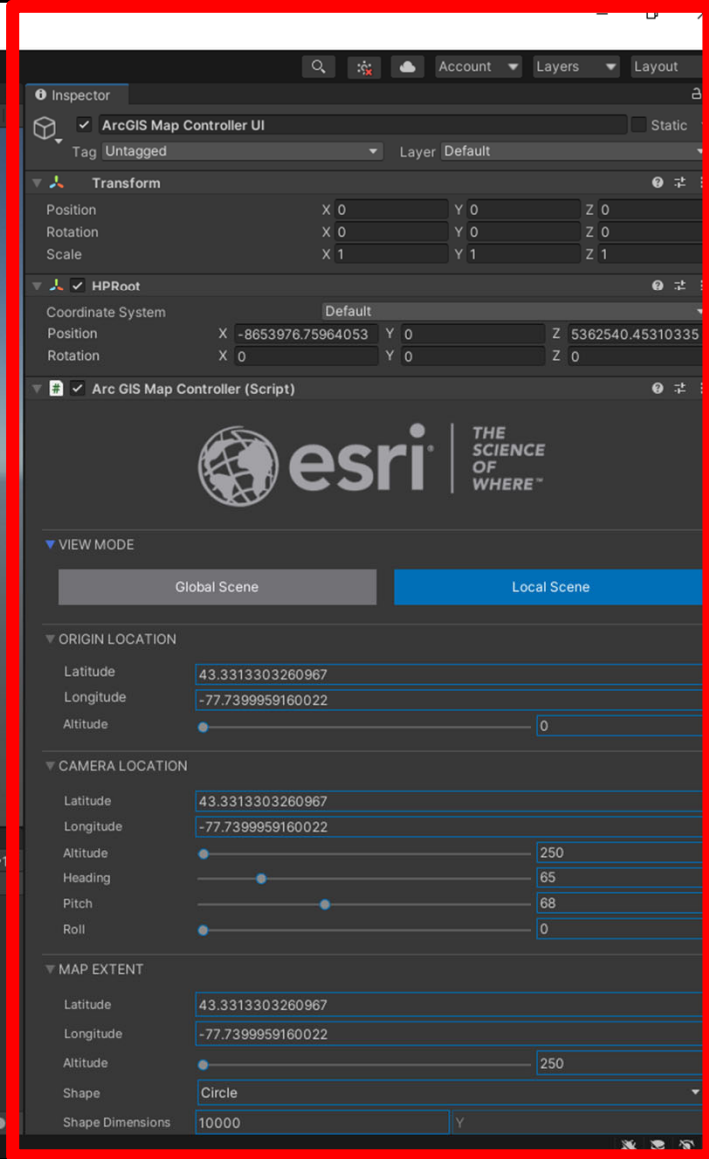
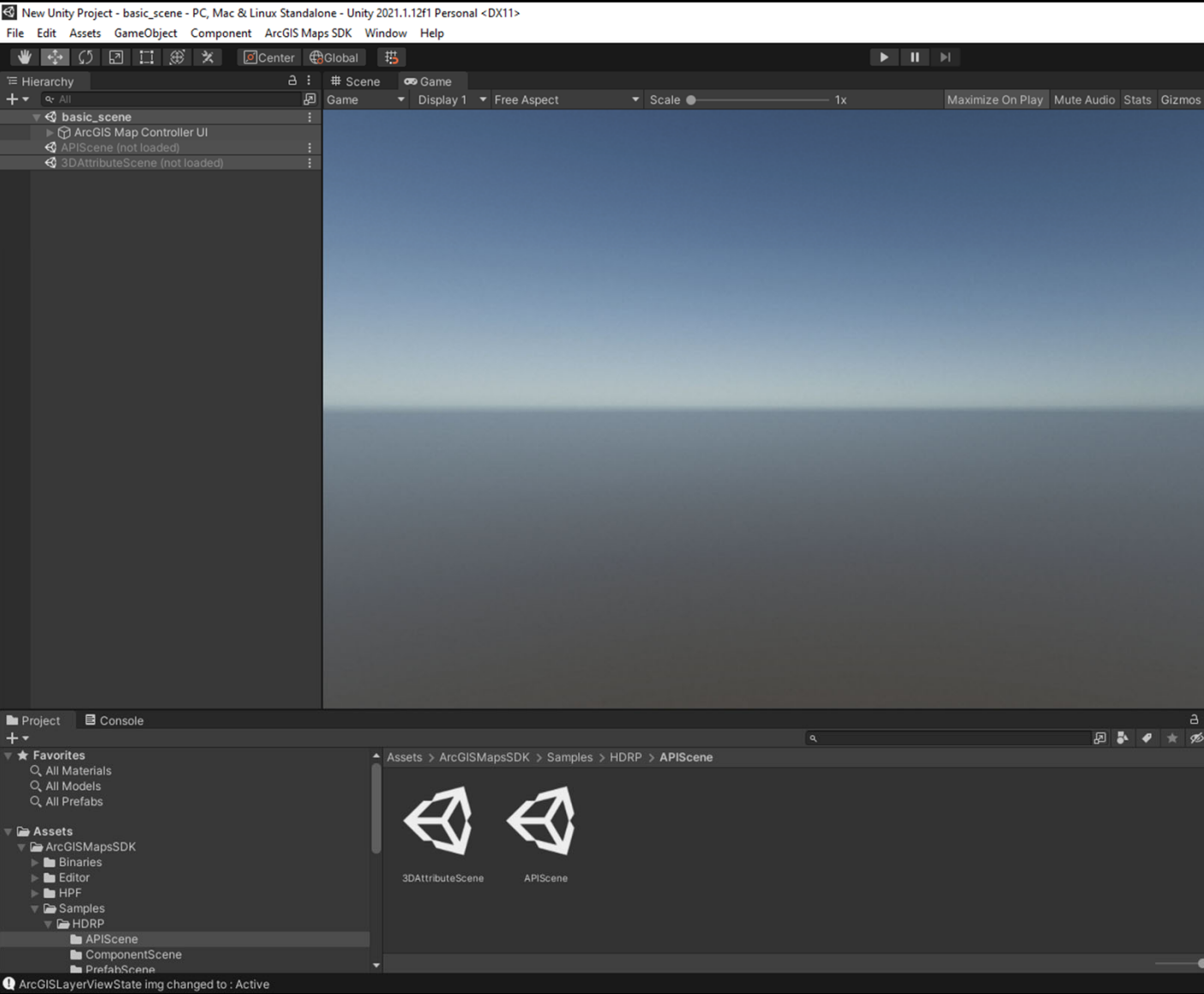
<https://earlyadopter.esri.com/key/ArcGISforGameEngines>

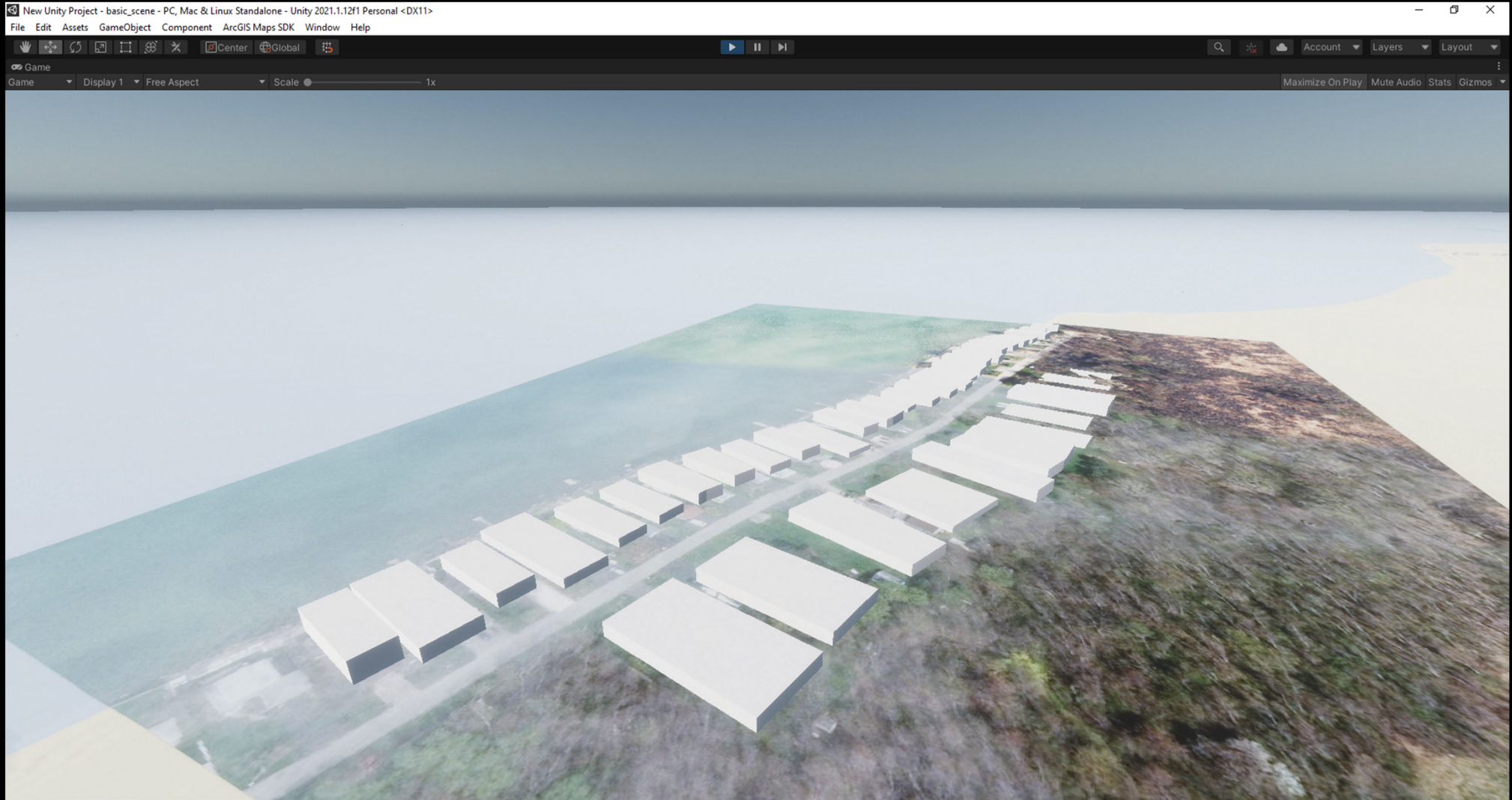
Unity: A Quick Tour



Demo: Unity and ArcGIS Maps SDK for Game Engines

Backup Slides if Unity Demo does not work





Demo: Project Lake Ontario



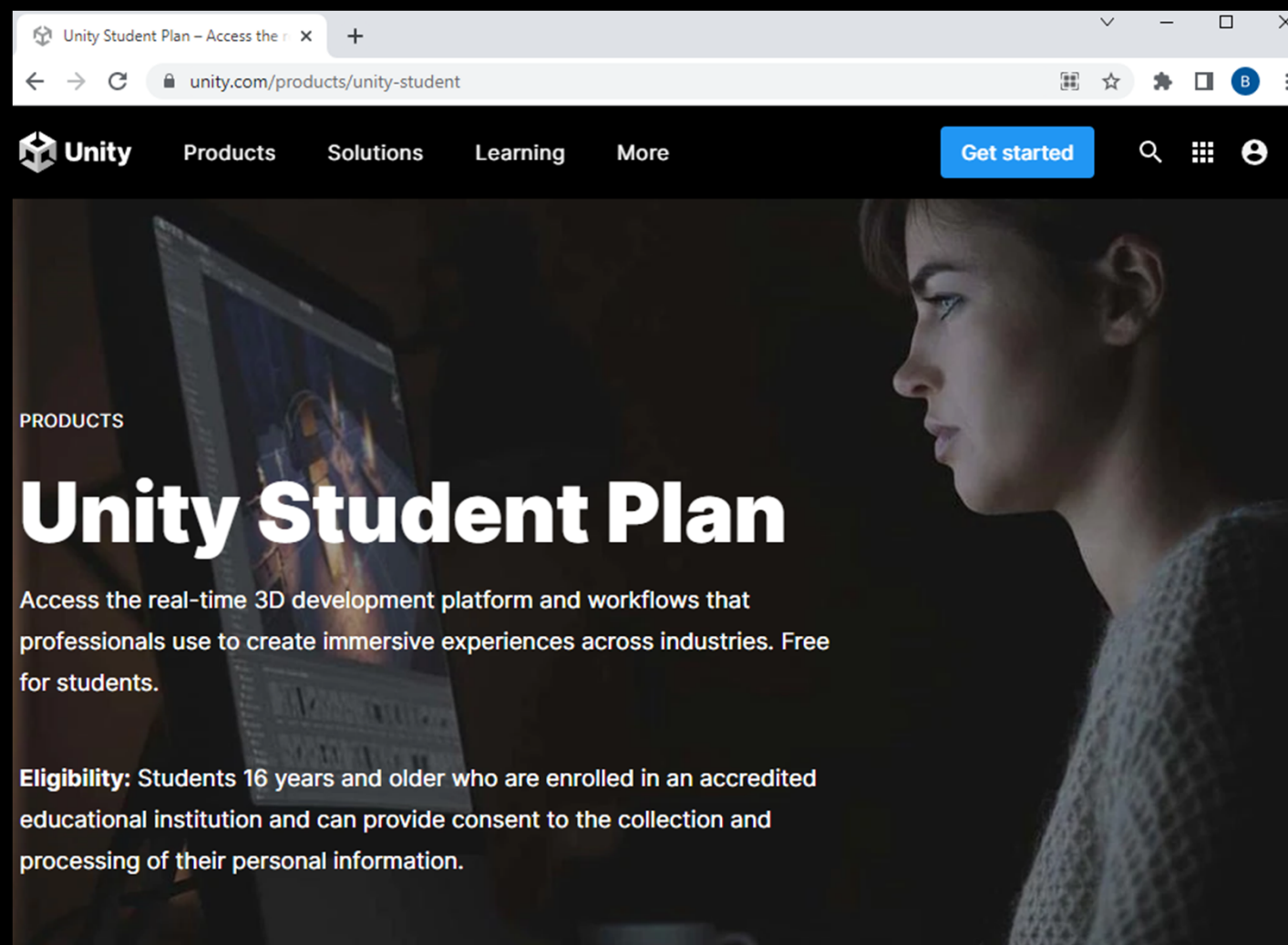
Backup Slides if PLO Demo does not work



Approximate Water Level: 249.82 ft



Where to go from here?

A screenshot of a web browser displaying the Unity Student Plan page. The browser's address bar shows the URL 'unity.com/products/unity-student'. The page features a dark background with a woman's profile on the right and a computer monitor on the left. The main heading is 'Unity Student Plan' in large white text. Below it, there is a paragraph of text and an eligibility section.

Unity Student Plan – Access the r x +

unity.com/products/unity-student

Unity Products Solutions Learning More Get started

PRODUCTS

Unity Student Plan

Access the real-time 3D development platform and workflows that professionals use to create immersive experiences across industries. Free for students.

Eligibility: Students 16 years and older who are enrolled in an accredited educational institution and can provide consent to the collection and processing of their personal information.

Unity Student Edition:
<https://unity.com/products/unity-student>

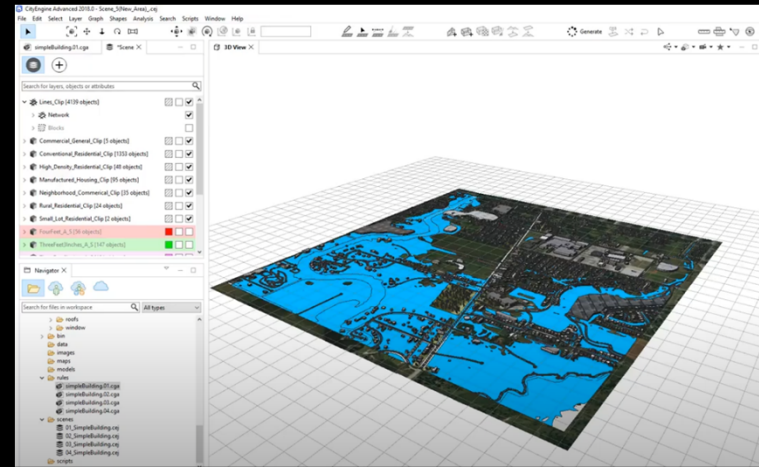
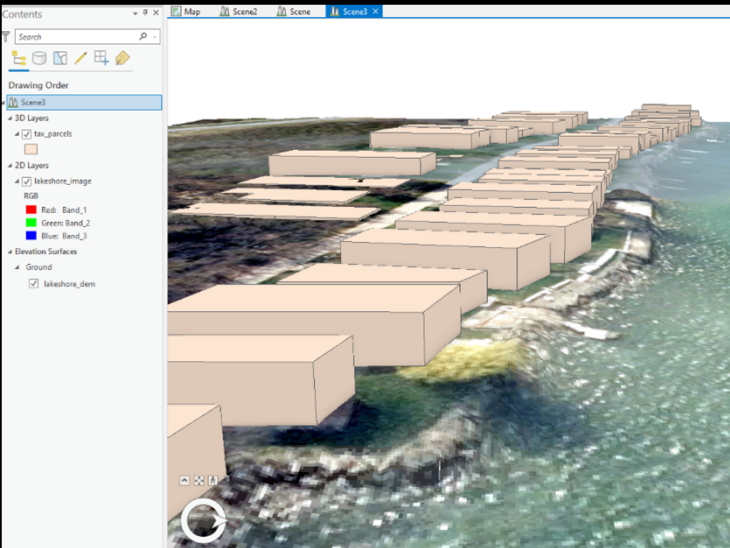
Where to go from here?

Learn 3D

Learn coding (C#)

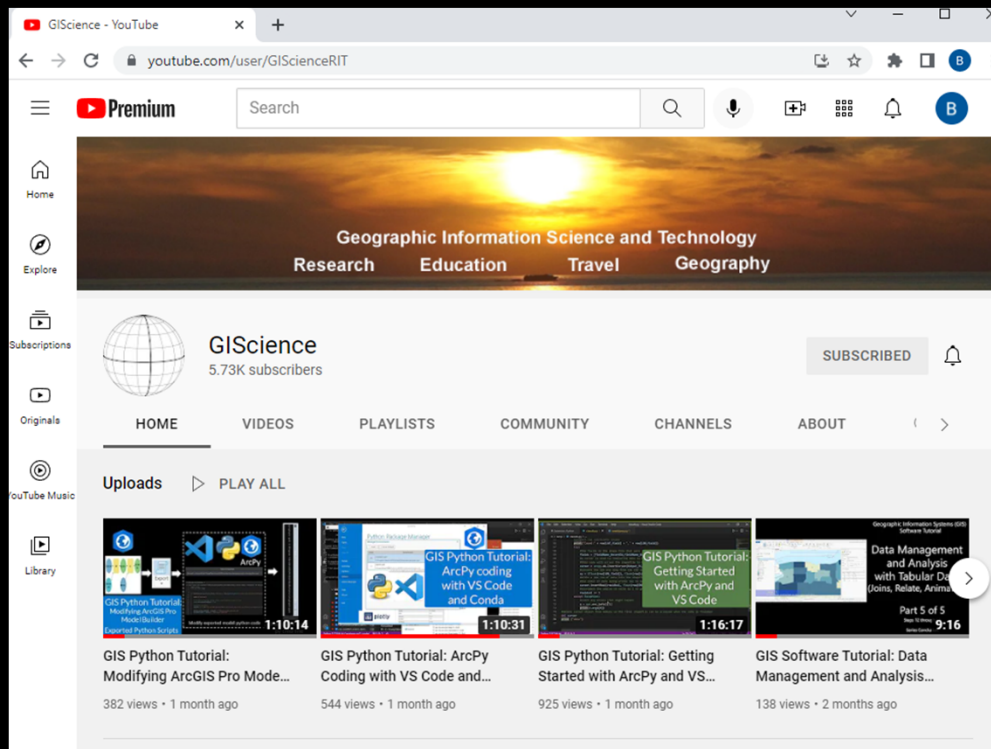
Study Game
Development

Try SDK first



```
APIScene_NY.cs - Visual Studio Code
Restricted Mode is intended for safe code browsing. Trust this window to enable all features. Manage Learn More

APIScene_NY.cs X
C:\temp > New Unity Project > Assets > ArcGISMapsSDK > Samples > Scripts > APIScene > APIScene_NY.cs
33
34
35
36
37
38 // API Key
39 string apiKey = ""; // "6b86b273ff34fce19d6b804eff5a3f5747ada4eaa22f1d49c01e52ddb7875b4b";
40
41 // Create the Map Document
42 var arcGISMap = new Esri.GameEngine.Map.ArcGISMap(mapType);
43
44 // Set the Basemap
45 arcGISMap.Basemap = new Esri.GameEngine.Map.ArcGISBasemap("https://www.arcgis.com/sharing/rest/content/items/8...");
46
47 // Create the Elevation
48 arcGISMap.Elevation = new Esri.GameEngine.Map.ArcGISMapElevation(new Esri.GameEngine.Elevation.ArcGISImageElev...);
49
50 // Create layers
51 var layer_1 = new Esri.GameEngine.Layers.ArcGISImageLayer("https://tiles.arcgis.com/tiles/n6t4QxSblgDfeJn9/arc...");
52 arcGISMap.Layers.Add(layer_1);
53
54 var layer_2 = new Esri.GameEngine.Layers.ArcGISImageLayer("https://tiles.arcgis.com/tiles/n6t4QxSblgDfeJn9/arc...");
55 arcGISMap.Layers.Add(layer_2);
56
57 var layer_3 = new Esri.GameEngine.Layers.ArcGIS3DModelLayer("https://tiles.arcgis.com/tiles/P3ePLMyz2RVChkX/a...");
```



<https://www.youtube.com/user/GIScienceRIT>

Thank you and
keep in touch!

Brian
Tomaszewski
bmtski@rit.edu