EnviroAtlas
people health nature economy
Lesson Plan
www.epa.gov/enviroatlas

Script to use with Teacher's Guide PowerPoint Slides

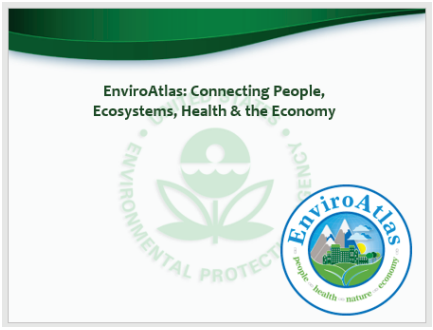
These materials are part of EPA Report #EPA/600/R-16/006.

SCRIPT TO USE WITH TEACHER'S GUIDE POWERPOINT SLIDES

Potential new vocabulary **underlined, in bold, and in green.**)

Slide 1: Introduction.

Today we're going to discuss how to use the EPA tool called *EnviroAtlas* in the Building A Greenway: Case Study. Basically, *EnviroAtlas* is a tool that provides a wealth of data and tools for researchers, educators, and decision-makers. I'll be showing you some of those today, and then I'll have you use them in a role-playing exercise about city planning.



Slide 2: Ecosystem Services.

- *EnviroAtlas* is organized around the benefits that we receive from nature, known as **ecosystem goods and services**.
- Our everyday lives are tied to them, and they have a huge impact on our physical and mental health.
- *EnviroAtlas* was developed to highlight the connections among the natural resources that provide these ecosystem services, people who benefit from them, and stressors that affect their provision.
    - Maybe sparked by these photos, can you think of what might be an ecosystem service?
    - What can you recognize in these pictures that would give you a healthier, safer, happier life? *Answer: clean air, clean water, wildlife, recreation, etc.*

Slide 3: *EnviroAtlas* Categories for Ecosystem Services.

Ecosystem services is a broad category, so we divided our data into seven.

- Clean Air
- Clean and Plentiful Water
- **Biodiversity** Conservation
- Food, Fuel & Materials
- Natural Hazard **Mitigation**
- Climate Stabilization
- Recreation, Culture & Aesthetics

Slide 4: Example.

It's great to have so much data, and even better to store it in one place. But here's an example of why all this matters at all.

Let's say you live in Fresno, CA and work for an organization that helps people have healthy, active lifestyles. You're starting up a project to engage the elderly community, but you aren't sure which neighborhoods to focus on. Where do they live, and where should you target your efforts?

Photo: http://www.huffingtonpost.ca/david-suzuki/nature-human-health_b_8040226.html

Slide 5: Access to Parks.

We can start off by learning more about people's access to parks. This map shows how far in meters a person has to walk to a park entrance. If it's green, then it's a short distance, and therefore it's easier for those people to get to a park to exercise. If it's red, then the people in that location live a long way from a park entrance, and they might need more help with getting engaged to exercise. It might be kind of hard to compare one location to another with this map or know what you're looking at exactly, but there are ways to go about it. One way that *EnviroAtlas* has this built in looks like… [next slide]

This map was part of the development of more data layers in EnviroAtlas. Many of them are summarized by census block groups, or groupings of city blocks that are units of measure in the US Census.

Slide 6: Access to Parks, Census Block Groups.

…this map. This map was made based on the previous one. You see the triangles and squares? These are called **census block groups**, or groupings of city blocks that are a unit of measure in the US Census. The size of block groups varies, and the lines are drawn based on population. So roughly the same number of people live in each polygon (shape), even

though, as you can see, they are very different sizes. Now with the block group we have a unit for comparison that contains roughly the same number of people in each.

Summarizing generalizes the numbers, but it often makes the information easier to work with.

So now we have a map by **block group**, showing how many people have to walk more than 500m (0.5 km, or 0.3 mile) to get to a park. If the shape is yellow or light green, then very few people live farther than 500m of a park entrance, if the shape is dark blue, then lots of people live far from a park entrance.

The *EnviroAtlas* team also added the orange dots, which, according to their size, show us what percent of the population is over 70 years old. The bigger the orange dot, the larger the percentage of the population over 70 years old. The smaller the dot, the smaller the percentage of the population that is over 70 years old.
Now, using this information, we can find a neighborhood with a **large elderly population that lives relatively far from parks**.

- What do we want to find? For the orange dots for elderly folks, do we want big, medium, or small dots? Why?
- For the block groups, do we want to find yellow, green or blue?

Answer: *You are looking for big orange dots on a dark blue block group, because this will show you when a large percentage of the population is over 70 and lives far from a park entrance. Then, you could reach out to folks in those areas to target them for your organization's "active lifestyles" efforts.*

Slide 7, Access to Parks, Area of Focus.
In the red box, here is one area that could use some of your organization's services to help elderly folks get to parks! For example, your organization could provide transportation for these areas. That's just one example of geospatial analysis, combining data layers to answer questions about human health and the environment.

Slide 8: *EnviroAtlas.*
Who uses EnviroAtlas? *EnviroAtlas* was designed to inform decision-making, education, and additional research. It includes a wealth of data, tools, and other resources. The data can be downloaded for more complex analyses, but the web map is easy to use and does not require prior **GIS (geographical information systems)** skills.

- Who has heard of GIS before? Does GPS ring a bell? Even if you haven't heard of it, I bet you are already users of it!

Slide 9: Maps & Geospatial Analysis, Part 1.

Here's an example you're already experts at using.

- On the left is a screenshot from Google Maps of the area around a high school.
- We call this layer the "**basemap**," and we can stack other information, other data layers, on top of it.
- We can see where things are and ask questions about how things relate, how places are connected, etc.

Slide 10: Maps & Geospatial Analysis, Part 2.

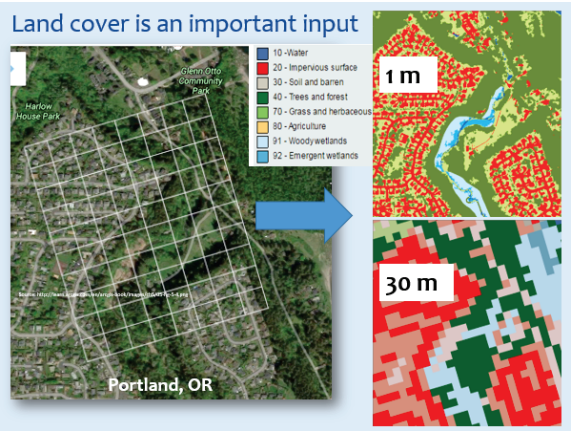
Here are bike routes laid over the basemap.

Slide 11: Maps & Geospatial Analysis, Part 3.

And here are traffic conditions for the major roads. If you use Google maps, you're already have some basic GIS skills!

- This is what we call the practice of **geospatial analysis**, and you do it in a platform or software called a **geographic information system**, or **GIS**.
- By stacking information, you can ask questions about the relationships between people and things across the landscape.
- Similar to Google maps, in *EnviroAtlas* you have a basemap and there are hundreds of data layers that you can display on top of it, but everything starts with land cover. We need to know where the natural resources are to even begin to assess their benefits to people, the ecosystem services. Only then can we connect the provider, the natural resources to the benefits available, to the people who benefit.
- All the data that follows needs to be based in the real world, with information of what's going on, on the ground, and that starts with land cover.

Slide 12: Land cover is an important input.



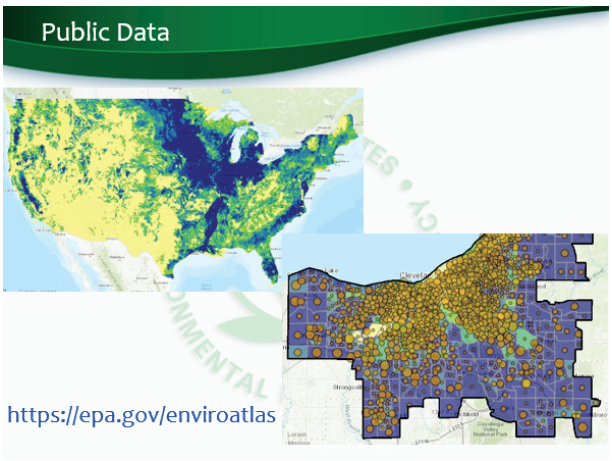
- To this end, the *EnviroAtlas* team developed a **high-resolution land cover classification**. We are classifying things on the ground into categories of land cover.
- What we mean by this is, we essentially are drawing a grid on a satellite image, and saying, for example, "within this box, the area is forest," or "within this box, the area is water."
- Just like with your phone screen or TV screen, the amount of information in your product varies by the pixel size. A smaller pixel lets us see in better detail. Tech companies are trying to produce ever smaller pixels, or **higher resolution** screens.

- So if, in the real world, a pixel represents a 1-meter by 1-meter square, we can get a lot more detail than a 30-meter by 30-meter square. You can see in the lower map where people have been building, but you can't see the exact shapes of the buildings themselves, in red. This land cover map on the bottom is used for the national data, because if you're looking at an entire country, this provides accurate enough information. But in the upper map, you can see the individual streets, driveways and houses. This is far more detail than is needed for national studies, but if we want to zoom into cities and just do a study on a given city, this fine detail is very important.
- Geospatial mappers don't do all of this by hand (that would take forever!); so mappers can teach the computer to recognize certain categories of land cover and then have it apply this knowledge to a larger area, and finally, they can check to see if it's right.
- You'll be seeing a land cover map again, when we get started with our exercise in a little while.

Photos: http://www.your-itdepartment.co.uk/news/apples-important-iphone-upgrades/
http://pixelatedgeek.com/2009/04/10-works-of-art-inspired-by-super-mario-bros/

Slide 13: Public data.

- Most of what the *EnviroAtlas* team does is develop data for their Interactive Map that's available to you online.
- The idea is that people can access the information on ecosystem services using the *EnviroAtlas* website and Interactive Map to answer questions related to ecosystem services across the country and in the places they live.
- Let's take a quick look at *EnviroAtlas*! ***<if you can, have the EnviroAtlas Interactive Map pre-loaded, with a layer or two on>***



Slide 14: Building a Greenway *(Take a moment to pause here for any questions.)*

Now it's up to you to decide where to build a **greenway**.

- How do you use your local greenways?
- What is a greenway for? Why build greenways?

< video: https://www.youtube.com/watch?v=84D8n65TeuI >

Photos: Black Creek – Black Creek Greenway, from http://www.traillink.com/trail-photos/black-creek-greenway.aspx
Kit Creek Greenway -
https://www.townofcary.org/Departments/Parks__Recreation___Cultural_Resources/Parks_and_Greenways/Greenways/Kit_Creek_Greenway.htm?

Slide 15: Canton Greenway.

I'll give you some extra information to read through, but **here are the basics of the decision we have to make**, as hypothetical residents of the fictional city of Canton.

1. Canton has a 2025 Sustainability Plan that includes goals such as:
    - Equal access to resources
    - Conservation of open space
    - Economic development
2. To accomplish the 2025 Sustainability Plan, Canton's Parks and Recreation Department applied and received an EPA Sustainability Grant
3. Unfortunately, the EPA Sustainability Grant only has enough money to complete a "pilot section" (*or initial section*) of the greenway
4. So, you are tasked with selecting the best pilot section possible in order to convince potential investors to fund the rest of the Greenway. The Parks and Recreation Department knows that there are positive health outcomes of greenways shown by eco-health research (which can be seen on the *EnviroAtlas* Eco-Health Relationship Browser online).

Photo credit: Riley Perszyk

Slide 16: Map of proposed trail network area in Canton.

To start off public commentary, the Parks and Rec. Department released a proposed pilot section, and denoted three other trail heads that could be the end points of an alternative pilot section. You can choose to support their pilot section, and find justifications for their decision. Or… you can pick another two trailheads to connect with the pilot section, and argue why your selection would be better and what benefits it provides from your stakeholder's point of view. You'll be getting some additional maps to help you make your decision.

Slide 17: Example of Maps that the students will receive, part 1.

Slide 18: Example of Maps that the students will receive, part 2.

Slide 19: Example of Maps that the students will receive, part 3.

Slide 20: Stakeholders, part 1.

Now going back to that video that we watched about Greenville's greenway, we heard from a few different stakeholders. **Stakeholders** are people who have an interest or concern in the decision being made, whether it is the construction of a greenway, the establishment of a new park, a change in transportation infrastructure, etc. In this case, it is the people who care about the greenway, and are affected by the greenway in some way. We can categorize people into different stakeholder groups, based on their occupation, interests, so can you think of any?

- Turn to the person next to you and see if you can come up with at least four stakeholders in the next 30 seconds. *Photo: http://lowcarbon.inforse.org/index.php?id=61*

Slide 21: Stakeholders, part 2.

Here are some stakeholder groups. Shortly we'll each be taking on the role of one stakeholder group, and trying to interpret the information and suggest a decision from that perspective.

Photos: http://www.deseretnews.com/article/865643896/Survey-says-parenting-experience-largely-formed-by-financial-situation.html?pg=all, http://images.wisegeek.com/mom-and-pop-vegetable-store.jpg, https://www.sfbike.org/wp-content/uploads/2014/02/Thumbnail_746x488-Education.jpg, http://www.fws.gov/refuge/Savannah/visit/visitor_activities/wildlife_viewing.html, http://www.fws.gov/uploadedImages/Region_3/NWRS/Zone_2/Seney_Complex/Seney/Sections/What_We_Do/Resouce_Management/bannerresearch.jpg, http://www.birminghamalcitycouncil.org/wp-content/uploads/2014/06/fullcouncil21.png

Slide 22: Stakeholder Groups.

Special interest groups:

- Wildlife enthusiasts – want to have habitat for wildlife and enjoy watching wildlife
- Local business owner – improve traffic to your storefront
- Neighborhood Parent Association – Wants what's best for their kids, safe, healthy, fun
- City Council Member – makes choices that are in the best interest for the greatest number of people, want to make a decision that moves the city toward the 2025 sustainability plan
- Environmental scientists – they study the natural and urban ecosystems, and want them to be healthy for wildlife and people
- City Bicycling Club – Enjoy active transportation for their commutes to work, school and for recreation

Each group is about to get a packet that has some additional information. As a group, you'll fill out the Understanding Maps worksheet. By the end of that, you'll be familiar with all the additional information in the map, and begin to formulate an opinion as to whether to support the currently proposed pilot section, or to choose a different placement. For either stance, you need to provide reasons for your decision.

Keep in mind, there is no right or wrong answer to this question!

You'll have about 15 minutes (20) to accomplish these goals, and then we will regroup for a City Council Public Hearing, and each group will briefly share their decision with the other stakeholder groups.

Remember that I'm here to answer questions as you go, and I understand that there is some specialized vocabulary in here. As you go, feel free to get creative and create a backstory for yourselves as local business owners, draw a dot for where you live and where your store is,

or as wildlife enthusiasts, maybe you like water animals best and want to walk close to the river, and incorporate this into your City Council presentation.

Photos: http://www.deseretnews.com/article/865643896/Survey-says-parenting-experience-largely-formed-by-financial-situation.html?pg=all, http://images.wisegeek.com/mom-and-pop-vegetable-store.jpg, https://www.sfbike.org/wp-content/uploads/2014/02/Thumbnail_746x488-Education.jpg, http://www.fws.gov/refuge/Savannah/visit/visitor_activities/wildlife_viewing.html, http://www.fws.gov/uploadedImages/Region_3/NWRS/Zone_2/Seney_Complex/Seney/Sections/What_We_Do/Resouce_Management/bannerresearch.jpg, http://www.birminghamalcitycouncil.org/wp-content/uploads/2014/06/fullcouncil21.png

Slide 23: Focus Questions

Slide 24: Example of Maps that the students will receive, part 1.

Slide 25: Example of Maps that the students will receive, part 2.

Slide 26: Example of Maps that the students will receive, part 2.

Slide 27: Time to Share.

Bring groups to the front of the room and have them make their pitches to the class about why they chose their route.

Slide 28: Time to Vote!

Slide 29: Final Slide of Greenway Image.

- On a scale from thumb up to thumb down, how easy to how hard was it to work with your stakeholder group?
- Luckily you were all of similar mindsets going into the decision-making process.
- Can you imagine how difficult it might be if your groups were mixed? With a group of twenty people, each coming at the decision from a very different perspective?

- This is a huge reason why *EnviroAtlas* provides these maps. Maps are visual, people can share and point at maps and build their conversation off of them, and they often end up playing quite a crucial role in decision-making processes.
- Thank you for your attention and for participating in this exercise! I hope it gave you a good look into what gets done on the EPA's *EnviroAtlas* team.

Photo credit: Sarina Lewis