Client-Side Web GIS

HTML

Image from NASA: https://commons.wikimedia.org/wiki/File:Earth_Western_Hemisphere_transparent_background.png#filelinks

AmericaView
Empowering Earth Observation Education
AmericaView.org - Est. 2003

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Setting up a Development Environment

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Client-Side Web Languages

HTML (Hypertext Markup Language) = used to create the basic structure and content of a webpage

https://www.w3schools.com/html/default.asp

CSS (Cascading Style Sheets) = used to design the webpage (where everything is placed and how it looks)

https://www.w3schools.com/css/default.asp

JavaScript = define the interactive elements of a webpage that helps to engage the users

https://www.w3schools.com/js/default.asp

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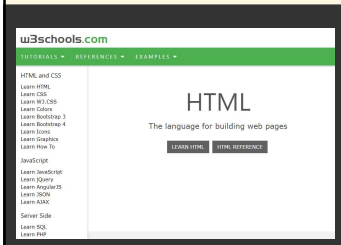
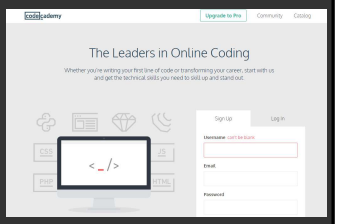
Learning to Code





https://www.w3schools.com/

https://www.codecademy.com/

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Book Recommendation

https://www.oreilly.com/library/view/html-css/9781118206911/

https://www.oreilly.com/library/view/javascript-and-jquery/9781118531648/

https://www.wiley.com/en-us/PHP+%26+MySQL%3A+Server+side+Web+Development-p-9781119149217

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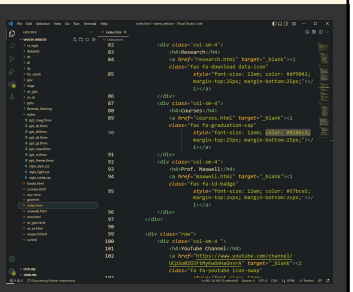
Using Text Editors

- Always use a plain text editor
- Don't type code in Word!
- Example: Notepad, Notepad++, Sublime Text, Atom, Brackets
- I like VS Code

https://code.visualstudio.com/



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Web Development Tools in VS Code

- Live Server: https://marketplace.visualstudio.com/items?itemName=ritwickdey.LiveServer
- Prettier: https://marketplace.visualstudio.com/items?itemName=esbenp.prettier-vscode

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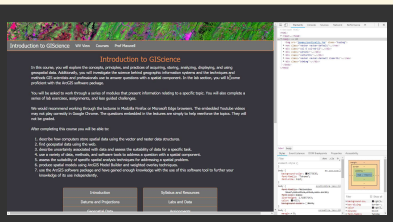
Developer Tools

- Google Development Tools (CTRL+SHIFT+I)
- Used for debugging/finding errors
- Debug HTML, CSS, and JavaScript



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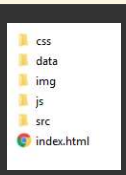
Set Up a Folder

- Create a folder to house an HTML project
- Common to name the main page index.html
- Create a folder for JavaScript code (js)
- Create a folder for CSS code (css)
- Create a folder for any downloaded source code (src)
- Create a folder for images and source data (img/data)



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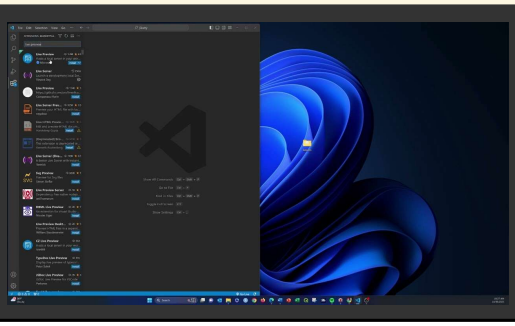
Video: VS Code Setup



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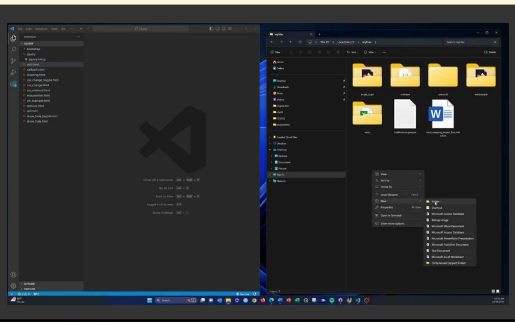
Video: Setup Website Directory



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HTML

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Basic Structure

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>

</body>
</html>
```

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
  <meta name="author" content="Aaron
      Maxwell">
  <meta name="description" content="An
      example HTML doc.">
</head>
<body>

</body>
</html>
```

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Encoding

- Defines the character set used
- Provided in meta tag
- Examples: ASCII, ANSI, 8859, and UTF-8
- We will use UTF-8

```html
<meta charset="UTF-8">
```

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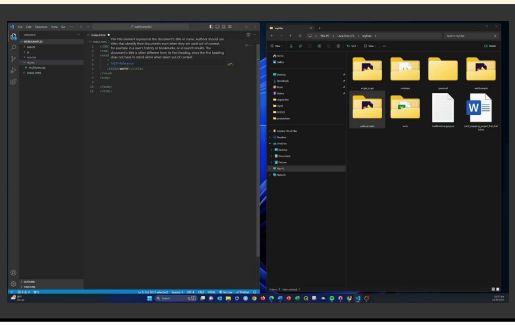
Video: Basic HTML Skeleton



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Elements

- Always have start tag
- Generally have end tag, but not all
- Content inserted between tags
- Elements can be nested within other elements
- Standard is to use lower case tags

```
<p>This is a paragraph</p>

<h1>This is a heading</h1>
```

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Headings

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
  <h1>This is an h1 heading.</h1>
  <h2>This is an h2 heading.</h2>
  <h3>This is an h3 heading.</h3>
  <h4>This is an h4 heading</h4>
  <h5>This is an h5 heading.</h5>
  <h6>This is an h6 heading.</h6>
</body>
</html>
```

This is an h1 heading.

This is an h2 heading.

This is an h3 heading.

This is an h4 heading

This is an h5 heading.

This is an h6 heading.

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Paragraphs

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
  <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Neque ab impedit commodi itaque non, odio cupiditate, suscipit maiores dolor iure mollitia, officiis ut soluta labore veniam qui reprehenderit placeat optio.</p>
  <p>Cum eligendi repellat, sint incidunt voluptatum autem illo aspernatur perferendis ea qui? Nemo sapiente enim dicta atque facilis autem, odit delectus aperiam dignissimos alias in! Quos consequatur eveniet quasi consectetur?</p>
</body>
</html>
```

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Neque ab impedit commodi itaque non, odio cupiditate, suscipit maiores dolor iure mollitia, officiis ut soluta labore veniam qui reprehenderit placeat optio.

Cum eligendi repellat, sint incidunt voluptatum autem illo aspernatur perferendis ea qui? Nemo sapiente enim dicta atque facilis autem, odit delectus aperiam dignissimos alias in! Quos consequatur eveniet quasi consectetur?

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Bold and Italic

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
    <p>This is how you <b>bold</b>
something.</p>
    <p>This is how you <i>italicize</i>
something.</p>
</body>
</html>
```

This is how you **bold** something.

This is how you *italicize* something.

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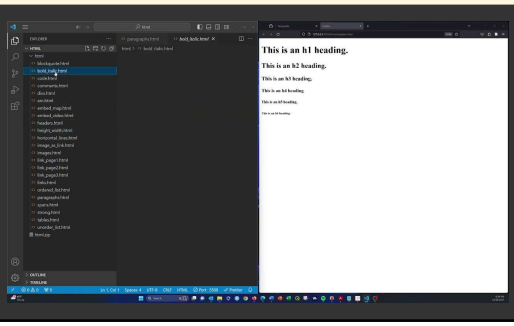
Video: p, h, b, and i Tags



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Links

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
<a
href="http://maxwellae.wixsite.com/maxwell-
geospatial" target="_blank">My Wepage</a>
</body>
</html>
```

My Wepage

Target attribute controls where to open the linked document

- _blank = open in new tab
- _self = open in same tab (default)
- _parent = open in parent frame
- _top = open in full body of window
- framename = open in a named frame

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Images

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <title>Document</title>
</head>
<body>
   <img
src="http://www.wvview.org/assets/img/WV_V
iew-04.png" alt="WV View">
</body>
</html>
```

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Image Height and Width

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <title>Document</title>
</head>
<body>
      <img
src="http://www.wvview.org/assets/im
g/WV_View-04.png" alt="WV View"
style="width:700px;height:450px;">
</body>
</html>
```

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <title>Document</title>
</head>
<body>
      <img
src="http://www.wvview.org/assets/img/WV_V
iew-04.png" alt="WV View" width="450"
height="700">
</body>
</html>
```

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Image as Link

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <title>Document</title>
</head>
<body>
   <a href="http://www.wvview.org/">
      <img
src="http://www.wvview.org/assets/img/WV_V
iew-04.png" alt="WV View">
   </a>
</body>
</html>
```

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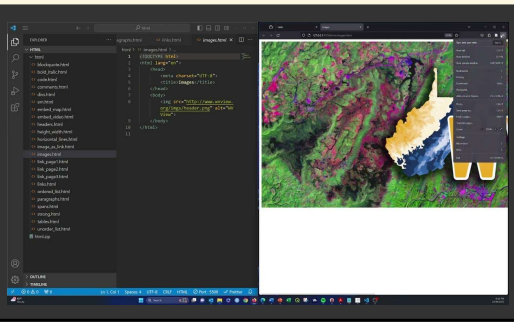
Video: Images and Links



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Unordered List

- Item 1
- Item 2
- Item 3

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
  <ul>
    <li>Item 1</li>
    <li>Item 2</li>
    <li>Item 3</li>
  </ul>
</body>
</html>
```

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Ordered List

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
 <ol>
   <li>Item 1</li>
   <li>Item 2</li>
   <li>Item 3</li>
 </ol>
</body>
</html>
```

1. Item 1
2. Item 2
3. Item 3

Type	Description
1	Numbered with numbers
A	Numbered with uppercase letters
a	Numbered with lowercase letters
I	Numbered with uppercase roman numbers
i	Numbered with lowercase roman numbers

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Tables

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
 <table style="width:100%">
   <tr>
     <th>Header 1</th>
     <th>Header 2</th>
     <th>Header 3</th>
   </tr>
  <tr>
   <td>Row 1 Col 1</td>
   <td>Row 1 Col 2</td>
   <td>Row 1 Col 3</td>
  </tr>
  <tr>
   <td>Row 2 Col 1</td>
   <td>Row 2 Col 2</td>
   <td>Row 2 Col 3</td>
  </tr>
 </table>
</body>
</html>
```

Header 1	Header 2	Header 3
Row 1 Col 1	Row 1 Col 2	Row 1 Col 3
Row 2 Col 1	Row 2 Col 2	Row 2 Col 3

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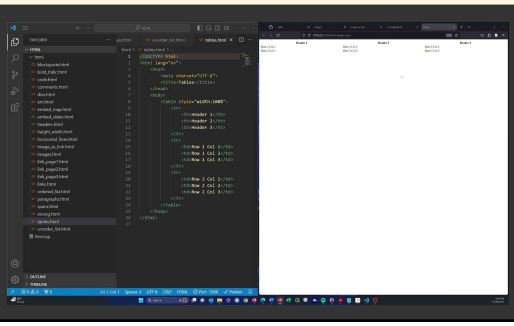
Video: Lists and Tables



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Horizontal Lines

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
 <p>Some text.</p>
 <hr>
 <p>Some more text.</p>
</body>
</html>
```

Some text.

Some more text.

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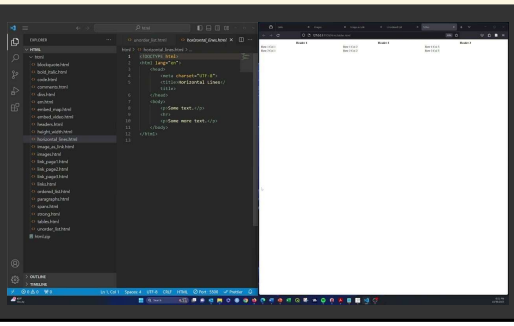
Video: Horizontal Rule



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Divs

- Defines division or section in HTML document
- Container for other HTML elements
- Can be used with CSS to define formatting

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
  <div>
    <h1>Header</h1>
  </div>
  <div>
    <p>Some text.</p>
  </div>
</body>
</html>
```

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Span

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
  <style>
  span{
    color:crimson;
    font-weight: bold;
    }
  </style>
</head>
<body>
  <p>Lorem ipsum dolor sit amet, consectetur adipisicing elit. Neque ab impedit commodi itaque non,
<span>odio cupiditate, suscipit maiores dolor iure mollitia</span>iciis ut soluta labore veniam qui
reprehenderit placeat optio.</p>
  <p>Cum eligendi repellat, sint incidunt voluptatum autem illo aspernatur perferendis ea qui? Nemo
sapiente enim <span>atque facilis autem</span> delectus aperiam dignissimos alias in! Quos consequatur
eveniet quasi consectetur?</p>
</body>
</html>
```

- Used to apply styles to inline elements
- Different from div since div is applied at block level

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Neque ab impedit commodi itaque non, **odio cupiditate, suscipit maiores dolor iure mollitia**iciis ut soluta labore veniam qui reprehenderit placeat optio.

Cum eligendi repellat, sint incidunt voluptatum autem illo aspernatur perferendis ea qui? Nemo sapiente enim **atque facilis autem** delectus aperiam dignissimos alias in! Quos consequatur eveniet quasi consectetur?

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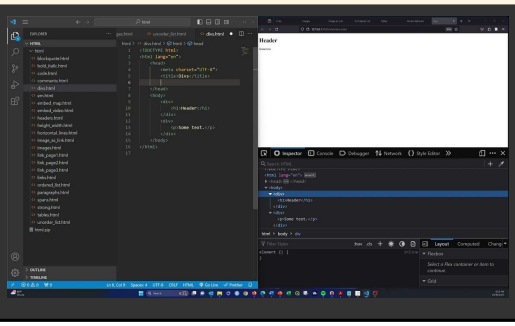
Video: Divs and Spans



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Blockquote

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Paragraphs</title>
</head>
<body>
  <blockquote cite="http://www.aag.org/cs/careers">The AAG offers a variety of resources to answer questions, guide your career planning, and help you find a job. AAG members can access job announcements through the Jobs in Geography Center. Members and non-members alike are invited to explore our profiles of individual geographers; information about specific occupations, skills, and salary trends; and an assortment of other career advice and information. Use the links in the left-hand navigation to get started!</blockquote>
</body>
</html>
```

- Block of text cited from another source

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Code

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Paragraphs</title>
</head>
<body>
  <h4>Example code below.</h4>
  <code>var y = "Google Earth Engine";</code>
</body>
</html>
```

- Block of code as plain text.

Example code below.

```
var y = "Google Earth Engine";
```

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em

- Emphasized text
- Better to just use CSS

Emphasized text!

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Paragraphs</title>
</head>
<body>
  <em>Emphasized text!</em>
</body>
</html>
```

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Strong

- Differentiate important text
- Better to just use CSS

This is important!

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Paragraphs</title>
</head>
<body>
  <strong>This is important!</strong>
</body>
</html>
```

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Comments

- Comments are not executed
- Can be used to make code more usable/human readable
- Can be used for debugging

Some text.

Some more text.

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>Document</title>
</head>
<body>
 <p>Some text.</p>
 <!-- A comment -->
 <p>Some more text.</p>
</body>
</html>
```

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Additional Tag Examples

https://www.w3schools.com/tags/default.asp

HTML Element Reference

‹ Home Next ›

HTML Tags Ordered Alphabetically

Search..

Tag	Description
<!--...-->	Defines a comment
<!DOCTYPE>	Defines the document type
<a>	Defines a hyperlink
<abbr>	Defines an abbreviation or an acronym
<acronym>	Not supported in HTML5. Use <abbr> instead. Defines an acronym

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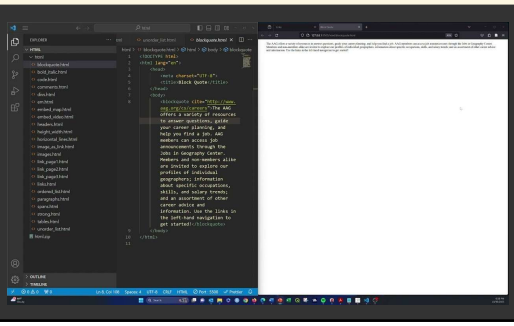
Video: Other Tags



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Additional Development Tools

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Emmet

- Plug-in
- Speeds up HTML and CSS workflows
- Link: https://emmet.io/
- Cheat Sheet: https://docs.emmet.io/cheat-sheet/

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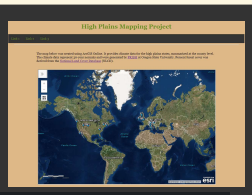
Embed a Map in HTML Page

- ArcGIS Online can produce CSS/HTML to add to a web document
- May need to manipulate the code to achieve the desired result.




```
<style>
.embed-container {position: relative; height: 600px; max-width: 75%; margin:auto}

.embed-container iframe, .embed-container object, .embed-container iframe{display: block; top: 0; left: 0; width: 100%; height: 100%;} small{position:
absolute; z-index: 40; bottom: 0; margin-bottom: -15px;}
</style>


<div class="embed-container">
<iframe width="200" height="200" frameborder="200" scrolling="no" marginheight="0" marginwidth="0" title="High Plains Map"
src="http://maps.arcgis.com/apps/Embed/index.html?
webmap=28ddd2dbb2cc4de5a7530e2647c609a7&extent=-101.7274,-29.2456,97.9015,70.0539&zoom=true&previewImage=false&scale=true&legendlayers=true&basemap_galle
ry=true&disable_scroll=true&theme=light">></iframe>
</div>
```

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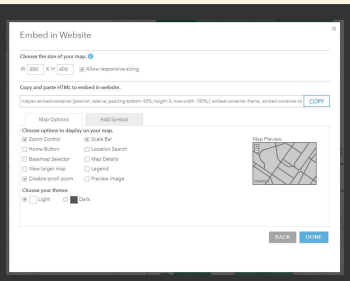
Embed a Map in HTML Page

- Open map
- Share
- Select EMBED IN WEBSITE
- Copy generated HTML and CSS
- Add to HTML document
- May need to edit to achieve desired results



*Must use Map Viewer Classic.

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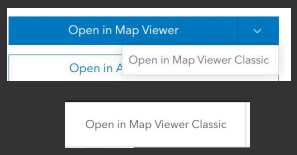
Classic Map Viewer

- Can access from map drop page using dropdown associated with Open in Map Viewer button
- Can also switch to Map Viewer Classic in the Map View



https://doc.arcgis.com/en/arcgis-online/share-maps/embed-maps-groups.htm

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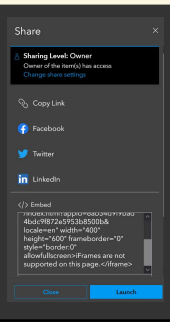
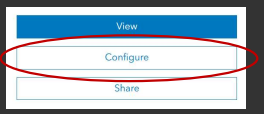
Embed App in a Website



- Some apps can be embedded in an iframe on a webpage
- Select Share in the app Configuration to obtain the code



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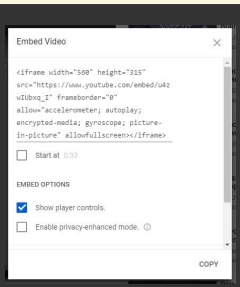
Embed a YouTube Video in HTML Page

- Go to YouTube
- Find Video
- Click SHARE
- Use Embed
- Copy generated code to HTML document
- May need to edit to achieve desired results



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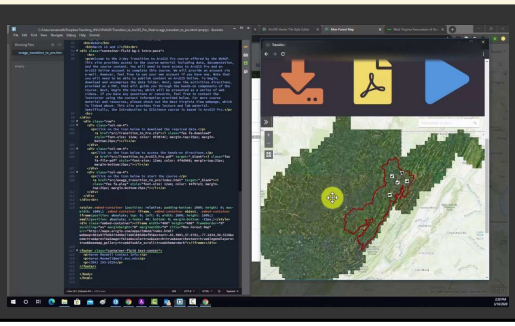
Video: Adding Maps to HTML Webpage



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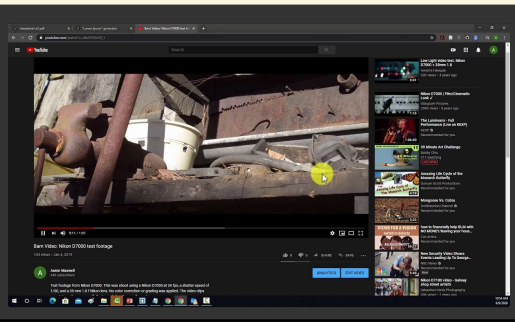
Video: Adding Video to HTML Webpage



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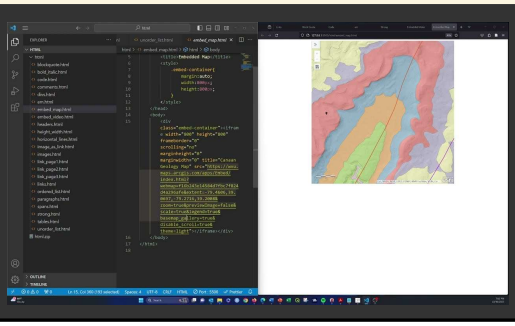
Video: Videos and Maps



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Linking Pages

- You can link pages to other pages using links and buttons
- Can link using URL for webpage
- Can link using link to HTML document on server

```
<ul class="nav navbar-nav">
    <li><a href="http://www.wvview.org/" target="_blank">WV View</a></li>
    <li><a href="course_directory.html">Courses</a></li>
    <li><a href="http://maxwellae.wixsite.com/maxwell-geospatial" target="_blank">Prof Maxwell</a></li>
</ul>
```

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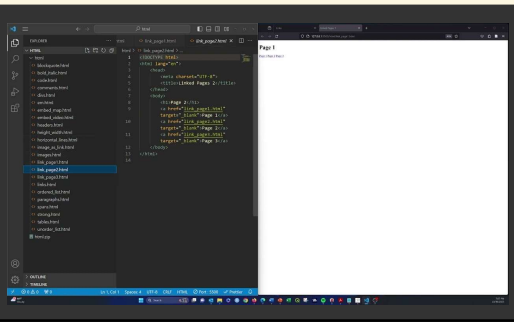
Video: Linking Pages



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This is the end of this lecture module.

Please return to the West Virginia View Webpage for additional content.

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