

Understanding the Arboretum APIs

The APIs return XML data describing various aspects of the WSU Landscape Arboretum. The APIs were developed using the .NET WebAPIs framework. They are managed via a WSU developed app.

At its most basic level, the APIs expose a list of entities and their attributes. An entity, also known as an object, can be thought of as a thing such as a tree, plant, shrub, rock, theme (aka Tours), etc. Basically, something we want to describe.

When creating an entity, a set of attributes is defined for that entity and then associated with that entity. They are meant to describe the entity.

Examples of attributes for a tree might include, among other things:

- Common Name
- Scientific Name
- Description
- Height
- Minnesota Native

The full list of attributes for a tree can be seen by calling the entity API.

Similarly, examples of attributes for a Theme (aka Tour) include:

- Description
- Color
- Id
- Name

Accessing APIs

API are accessed via URLs. There are three main URLs available to retrieve information:

List of themes

<https://w3.winona.edu/locations/api/themes>

```
▼<ArrayOfThemeData xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://schemas.dataacc
  ▼<ThemeData>
    <Description>Learn about various trees found on Winona State's campus.</Description>
    <ThemeColor i:nil="true"/>
    <ThemeId>1</ThemeId>
    <ThemeName>Tree Tour</ThemeName>
  </ThemeData>
  ▼<ThemeData>
    <Description>A legume is a plant in the family Fabaceae, or the fruit or seed of such
    soil rhizobium (beneficial bacteria).</Description>
    <ThemeColor i:nil="true"/>
    <ThemeId>3</ThemeId>
    <ThemeName>Legume Family</ThemeName>
  </ThemeData>
  ▼<ThemeData>
    <Description>Grasses, or more technically graminoids, are monocotyledonous, usually h
    <ThemeColor i:nil="true"/>
    <ThemeId>4</ThemeId>
    <ThemeName>Grass Family</ThemeName>
  </ThemeData>
```

Figure 1: List of Themes

Theme

[https://w3.winona.edu/locations/api/themes/\[themeID\]](https://w3.winona.edu/locations/api/themes/[themeID])

```
▼<ArrayOfThemeEntityAbridgedData xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://schemas.dataacc
  ▼<ThemeEntityAbridgedData>
    <DefaultImagePath>https://w3.winona.edu/Locations/Resources/AustrianPine.png</DefaultImagePath>
    <DisplayName>Austrian Pine</DisplayName>
    <EntityId>3</EntityId>
    <GeoLocation>[{"Lat": "44.047318", "Lng": "-91.644497"}]</GeoLocation>
  </ThemeEntityAbridgedData>
  ▼<ThemeEntityAbridgedData>
    <DefaultImagePath>https://w3.winona.edu/Locations/Resources/ThornlessHoneylocust.png</DefaultImagePath>
    <DisplayName>Thornless Honeylocust</DisplayName>
    <EntityId>33</EntityId>
    <GeoLocation>[{"Lat": "44.047550", "Lng": "-91.643910"}]</GeoLocation>
  </ThemeEntityAbridgedData>
  ▼<ThemeEntityAbridgedData>
    <DefaultImagePath>https://w3.winona.edu/Locations/Resources/AutumnPurpleAsh.png</DefaultImagePath>
    <DisplayName>Autumn Purple Ash</DisplayName>
    <EntityId>4</EntityId>
    <GeoLocation>[{"Lat": "44.047730", "Lng": "-91.644270"}]</GeoLocation>
  </ThemeEntityAbridgedData>
```

Figure 2: Theme 1

Entity

[https://w3.winona.edu/locations/api/entities/\[entityID\]](https://w3.winona.edu/locations/api/entities/[entityID])

```
▼<ThemeEntityData xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://w3.winona.edu/locations/api/entities" EntityId="280">
  ▼<AttributeValues>
    ▼<AttributeValuesData>
      <AttributeName>Description</AttributeName>
      <AttributeType>Text</AttributeType>
      <AttributeValue>Corylus americana or the American Filbert is also known as the hickory nut. American Filbert is a relatively large shrub with a thick bark and a dense understory and influences succession of canopy trees. </AttributeValue>
      <EntityId>280</EntityId>
    </AttributeValuesData>
    ▼<AttributeValuesData>
      <AttributeName>Bark</AttributeName>
      <AttributeType>Text</AttributeType>
      <AttributeValue>Numerous upright stems, 3 cm dbh. First year branchlets are smooth. </AttributeValue>
      <EntityId>280</EntityId>
    </AttributeValuesData>
    ▼<AttributeValuesData>
      <AttributeName>Common Name</AttributeName>
      <AttributeType>Text</AttributeType>
      <AttributeValue>American Filbert, American Hazelnut</AttributeValue>
      <EntityId>280</EntityId>
    </AttributeValuesData>
  </AttributeValues>
  <IsDefaultLocation>false</IsDefaultLocation>
  <LocationId>160</LocationId>
  <ResourceId>160</ResourceId>
</ThemeEntityData>
```

Figure 3: Entity 280

In addition to attributes, each entity has a set of Locations and Resources associated with that entity.

Locations

Locations are Lat/Lng data for that entity and an attribute of whether that location is the default location. An example of this would be the Lat/Lng for every instance of Homestead Elm on campus with the specific reference tree marked as `<IsDefaultLocation>true</IsDefaultLocation>`.

```
▼<Locations>
  ▼<LocationData>
    <EntityId>16</EntityId>
    <EntityName>Homestead Elm</EntityName>
    <EntityType>Tree</EntityType>
    <GeoLocation>[{"Lat": "44.046760", "Lng": "-91.644880"}]</GeoLocation>
    <IsDefaultLocation>true</IsDefaultLocation>
    <LocationId>160</LocationId>
  </LocationData>
</Locations>
```

Figure 4: Location data

Resources

These attributes denote media-type resources associated with the entity. They can include images, audio, and video.

```
▼ <ResourceData>
  <Description>Homestead Elm leaf2</Description>
  <EntityId>16</EntityId>
  <IsDefault>>false</IsDefault>
  <Path>https://w3.winona.edu/Locations/Resources/HomesteadElm_Leaf2.png</Path>
  <ResourceId>61</ResourceId>
  <ResourceType>Image</ResourceType>
  <ResourceTypeId>1</ResourceTypeId>
</ResourceData>
▼ <ResourceData>
  <Description>Homestead elm</Description>
  <EntityId>16</EntityId>
  <IsDefault>>false</IsDefault>
  <Path>https://w3.winona.edu/Locations/Resources/Homestead elm.mp3</Path>
  <ResourceId>193</ResourceId>
  <ResourceType>Audio</ResourceType>
  <ResourceTypeId>2</ResourceTypeId>
</ResourceData>
```

Figure 5: Resources data

FAQ

Question: How do I get the tree description via the API for a specific tree?

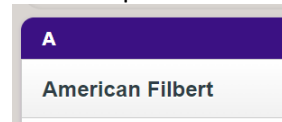
Answer

Entity attributes, such as tree description, can be access via the entities API:

[https://w3.winona.edu/locations/api/entities/\[id\]](https://w3.winona.edu/locations/api/entities/[id])

The id for the entity, a tree in this case, can be found by looking at the URL to a specific tree on the site.

For example: American Filbert - <https://www.winona.edu/m/arboretum/about.asp?e=280>



Mouseover/inspect/click the link to American Filbert to get its entity id from the url. 280 is the entity Id for American Filbert. From the XML you can parse out the description.

```

▼<ThemeEntityData xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="
  ▼<AttributeValues>
    ▼<AttributeValuesData>
      <AttributeName>Description</AttributeName>
      <AttributeType>Text</AttributeType>
      <AttributeValue>Corylus americana or the American Filbert is also known
surrounds the nut. American Filbert is a relatively large shrub with no
understory and influences succession of canopy trees. </AttributeValue>
      <EntityId>280</EntityId>
    </AttributeValuesData>
    ▼<AttributeValuesData>
      <AttributeName>Bark</AttributeName>
      <AttributeType>Text</AttributeType>
      <AttributeValue>Numerous upright stems, 3 cm dbh. First year branchlet
      <EntityId>280</EntityId>
    </AttributeValuesData>
    ▼<AttributeValuesData>

```

Figure 6: American Filbert data

Question: How do I get Theme data from the API for a specific theme?

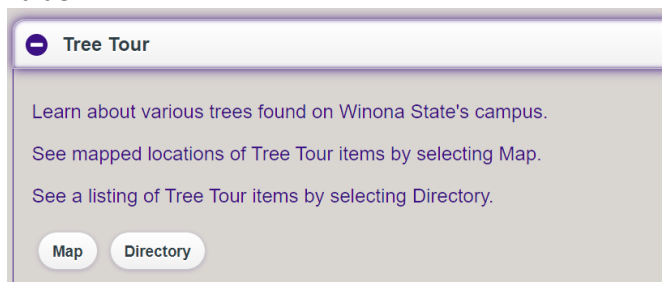
Answer

You can find a theme id by going to the web app and viewing the list of pre-defined tours.

<https://www2.winona.edu/m/arboretum/default.asp>

Note: tour and theme refer to the same thing and are terms used interchangeably.

Select a tour and Mouseover/inspect/click the link for the tour you're interested in to find the t=[id] value.



Append that value to the theme (tour) url [https://w3.winona.edu/locations/api/themes/\[id\]](https://w3.winona.edu/locations/api/themes/[id]).

```

▼<ArrayOfThemeEntityAbridgedData xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="http://schemas.dataacc
  ▼<ThemeEntityAbridgedData>
    <DefaultImagePath>https://w3.winona.edu/Locations/Resources/AustrianPine.png</DefaultImagePath>
    <DisplayName>Austrian Pine</DisplayName>
    <EntityId>3</EntityId>
    <GeoLocation>[{"Lat": "44.047318", "Lng": "-91.644497"}]</GeoLocation>
  </ThemeEntityAbridgedData>
  ▼<ThemeEntityAbridgedData>
    <DefaultImagePath>https://w3.winona.edu/Locations/Resources/ThornlessHoneylocust.png</DefaultImagePath>
    <DisplayName>Thornless Honeylocust</DisplayName>
    <EntityId>33</EntityId>
    <GeoLocation>[{"Lat": "44.047550", "Lng": "-91.643910"}]</GeoLocation>
  </ThemeEntityAbridgedData>
  ▼<ThemeEntityAbridgedData>
    <DefaultImagePath>https://w3.winona.edu/Locations/Resources/AutumnPurpleAsh.png</DefaultImagePath>
    <DisplayName>Autumn Purple Ash</DisplayName>
    <EntityId>4</EntityId>
    <GeoLocation>[{"Lat": "44.047730", "Lng": "-91.644270"}]</GeoLocation>
  </ThemeEntityAbridgedData>

```

Figure 7: Tree tour theme