Mapping the UTBIOME

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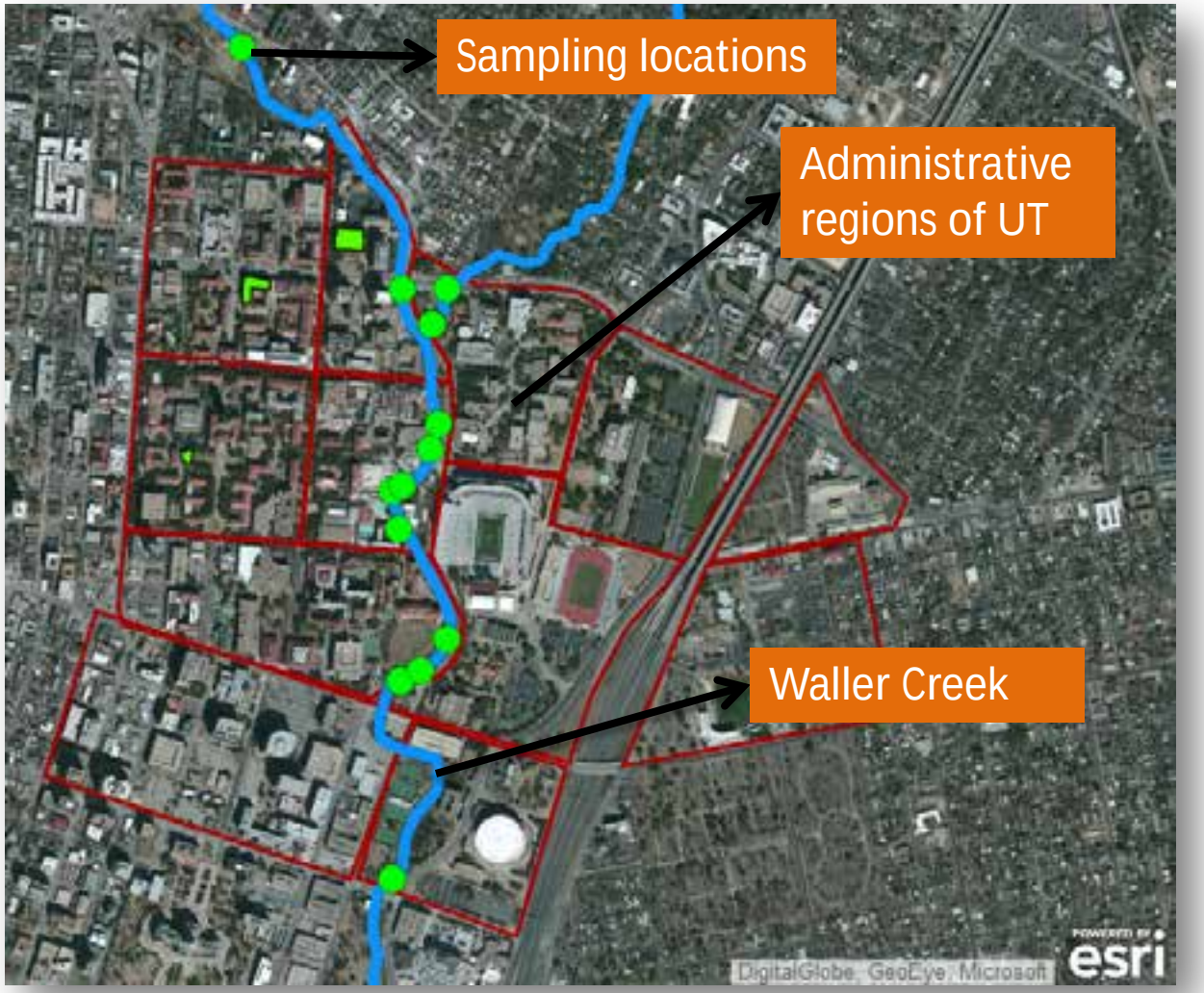
Motivation and Objectives

- Engage UT community in collection and analysis of environmental samples.
- Develop an interactive mapping platform and data portal for citizens and researchers.
- Establish framework to support sustainability and health initiatives at UT and elsewhere

UT “A living Laboratory”

- UT campus as a “living” laboratory to collect environmental data.
- Map the communities of microbes living in the air and water around us.
- Provide a platform to share and collaborate.



Sampling Campaigns

Classroom study

Waller creek

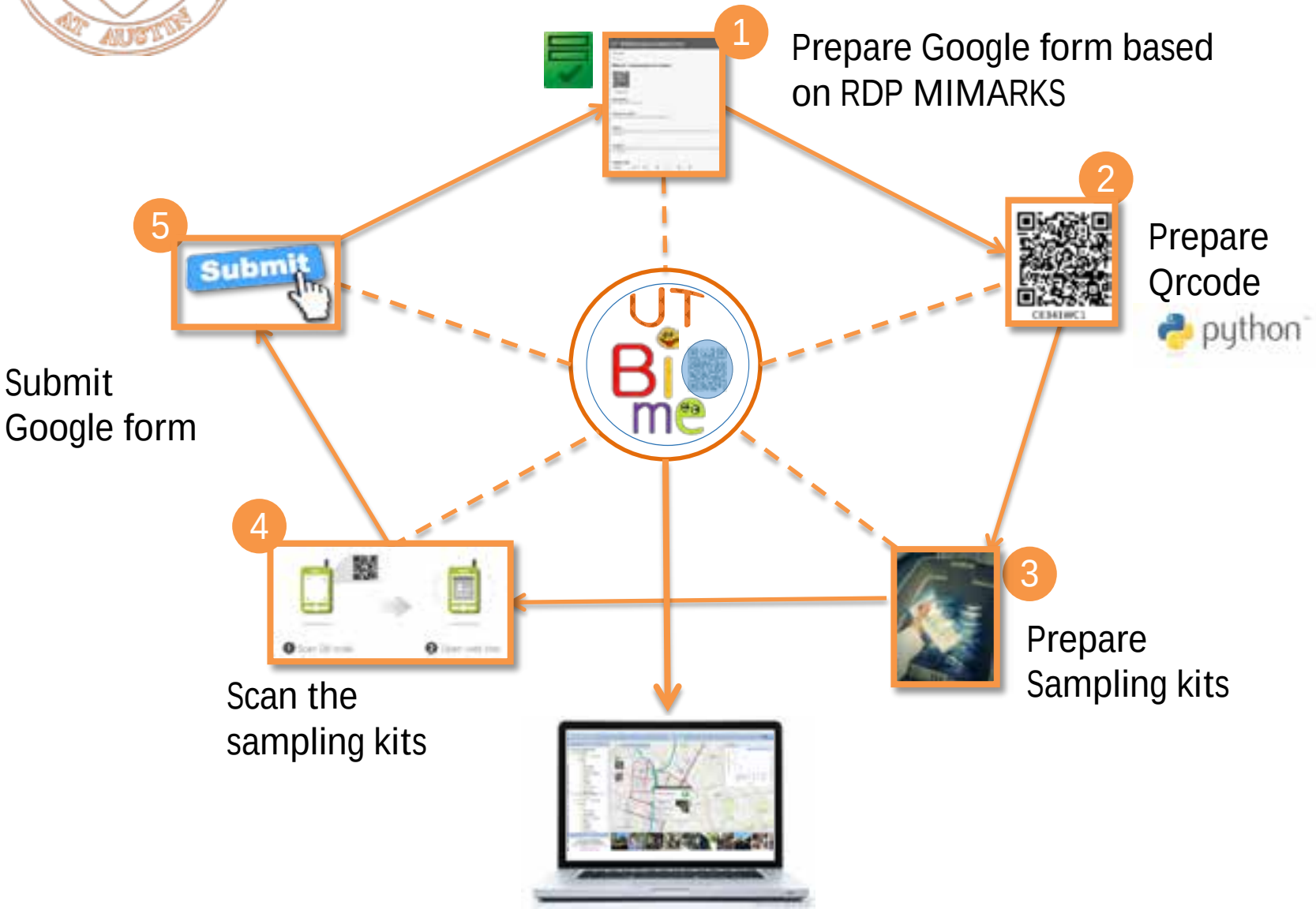
Battle Hall study

UT AUSTIN

- > 250 students involved
- CSE, Environmental Science Institute, School of Nursing, Sequencing Center, Integrative Biology

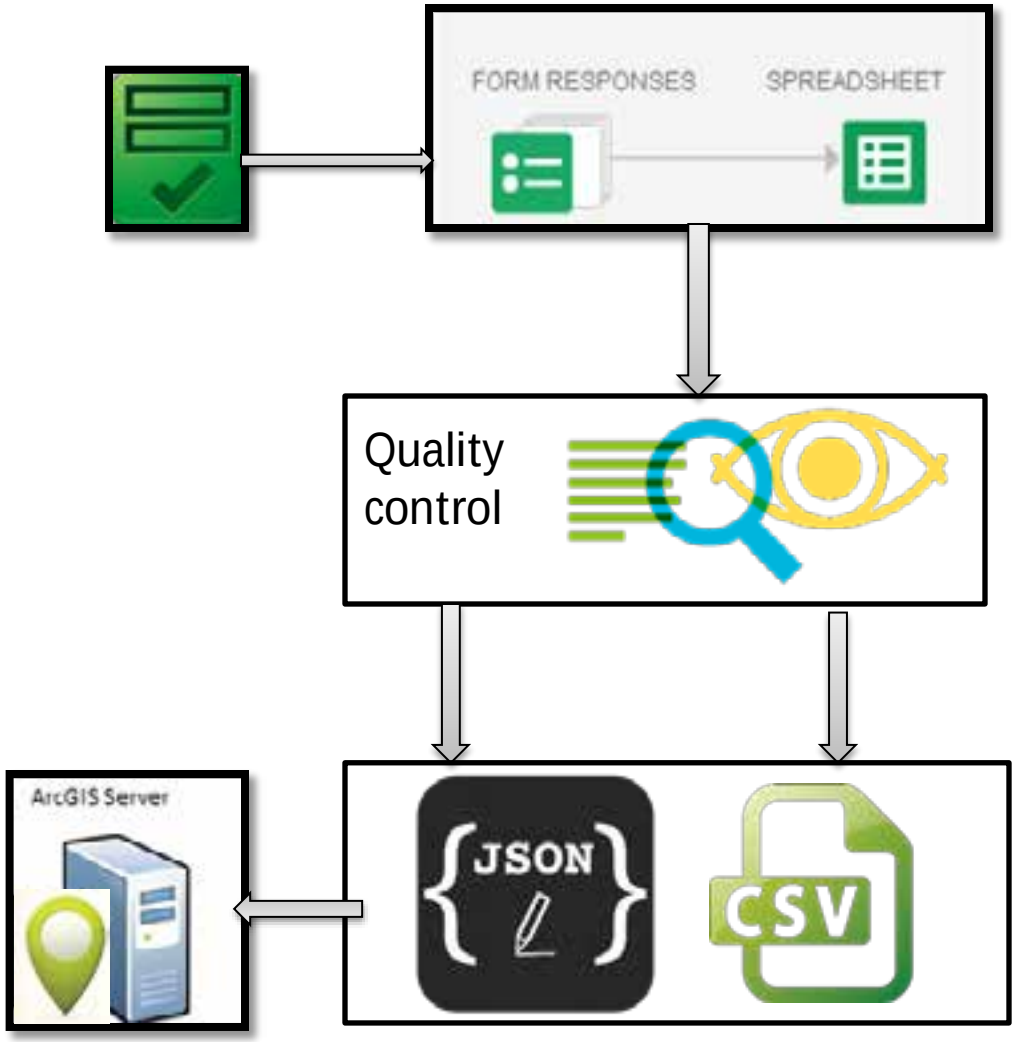
Forty acres

Sample tracking system



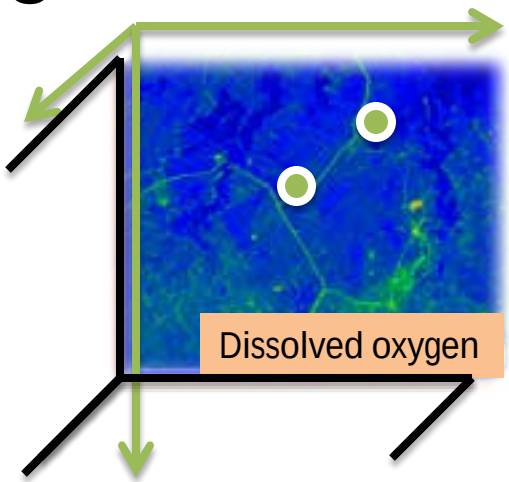
Data Curation

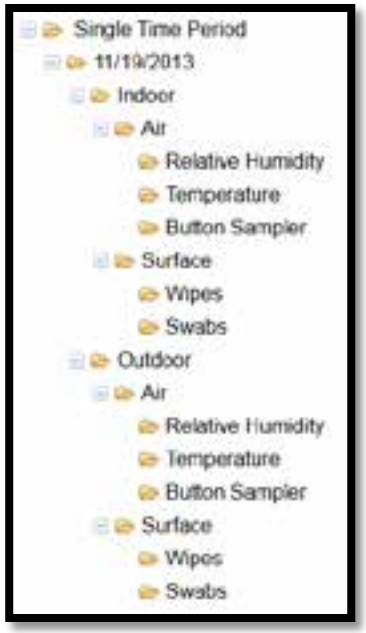
- Data curation is done in steps
  - Gather the responses from Google forms
  - Check for quality
  - Arrange the data in a pre-decided format
  - Save the data as *.json, and *.csv files
  - Make map services for features and publish using ArcGIS server



Data Challenges

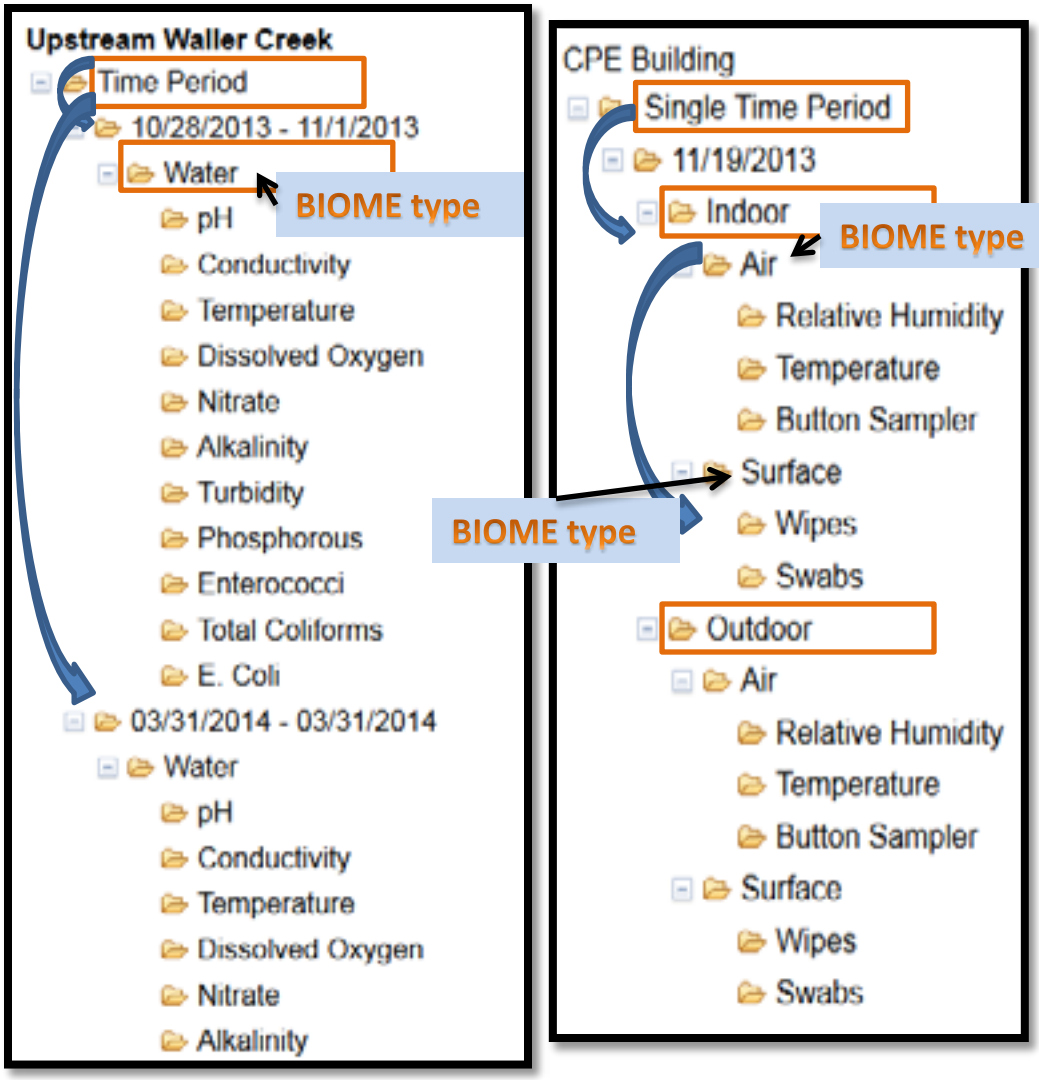
- Spatiotemporal data sets
- Data hierarchy and meta data representation was not simple.
- Some locations had time series collections, while others were single time periods.
- Sampling locations involved both outdoor (e.g. creek) and indoor locations (e.g. levels of buildings)





Meta data organization

- Sampling locations
  - Outdoor
    - time series data
      - Multiple variables
    - static data
      - Waller creek cross sections
  - Indoor
    - static data
      - Class room study
- A tree structure was implemented to allow users traverse through the data per sampling location.
- The tree structure is created for different type of sampling types within a *.json file and displayed when clicked on the feature



Interactive Mapping Platform

- The interactive mapping platform was built using HTML5, CSS3 and JavaScript.
- We used ArcGIS API for JavaScript, dojo toolkit in combination with HTML5 and CSS3 where necessary.

ArcGIS API for JavaScript

https://developers.arcgis.com/javascript/

dojo toolkit

http://dojotoolkit.org/

Font Awesome 3.2

http://fortawesome.github.io/Font-Awesome/

```
<link rel="stylesheet" href="http://js.arcgis.com/3.9/js/esri/css/esri.css">
<script src="http://js.arcgis.com/3.9/"></script>
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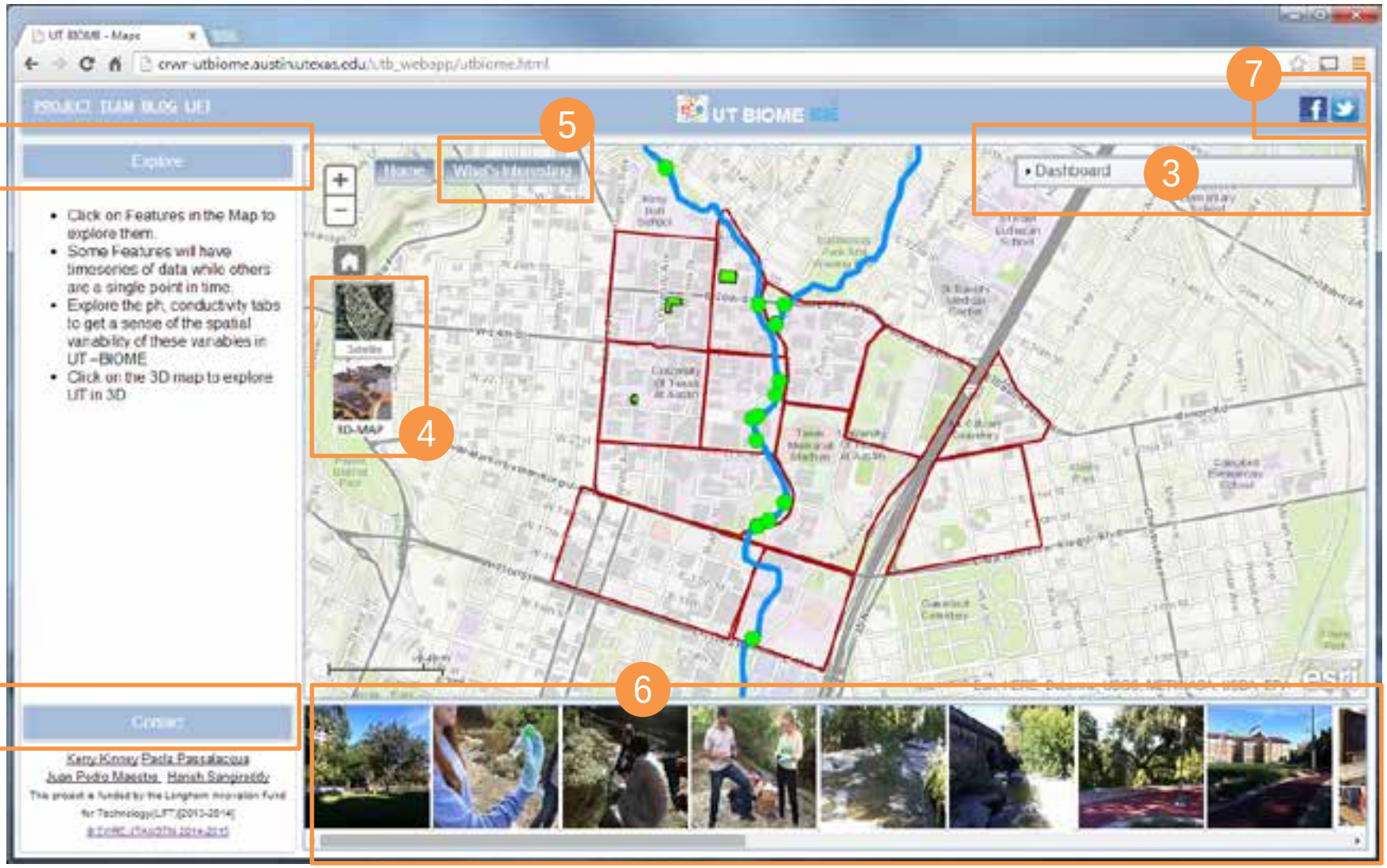
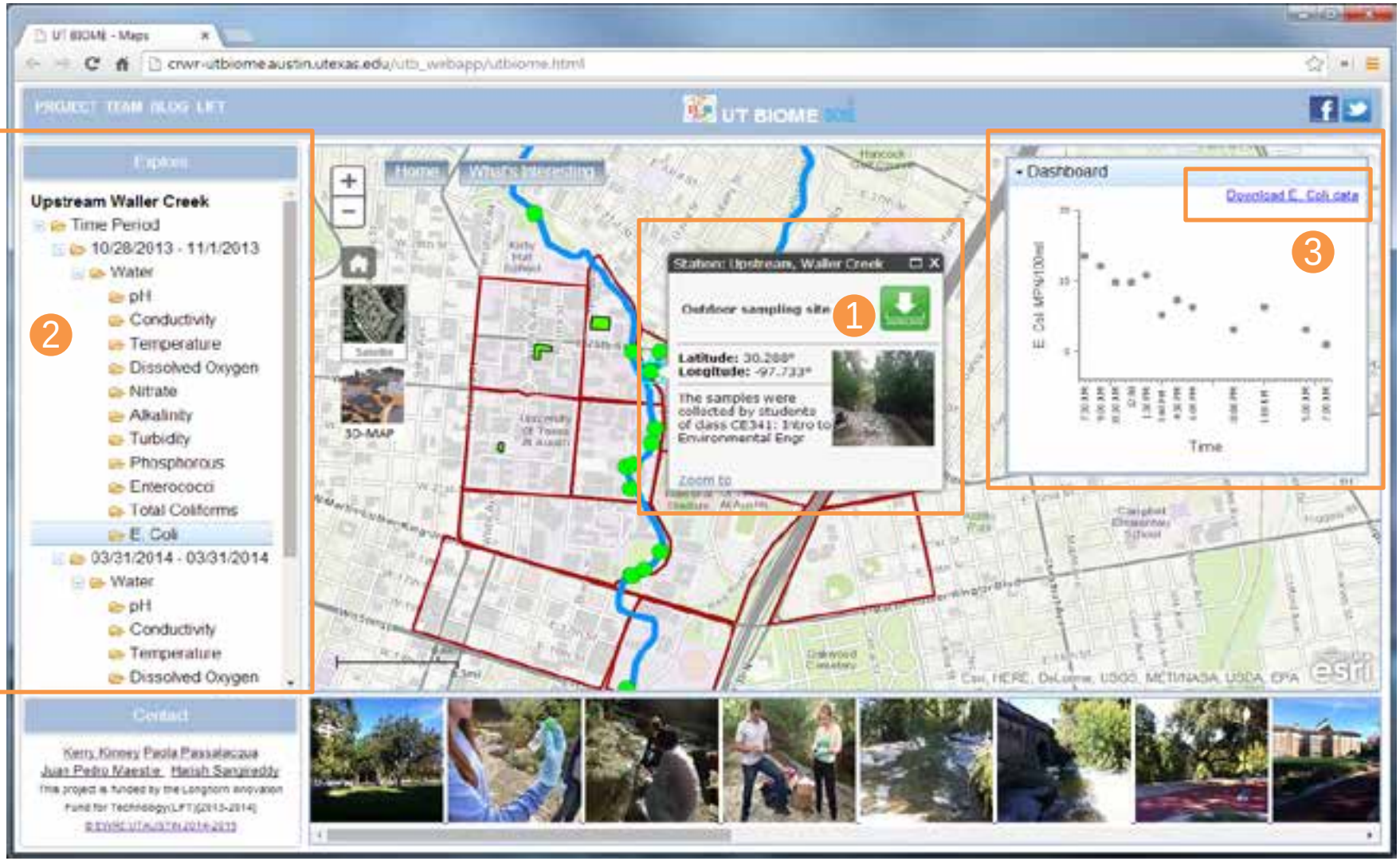
UTBIOME – Map components

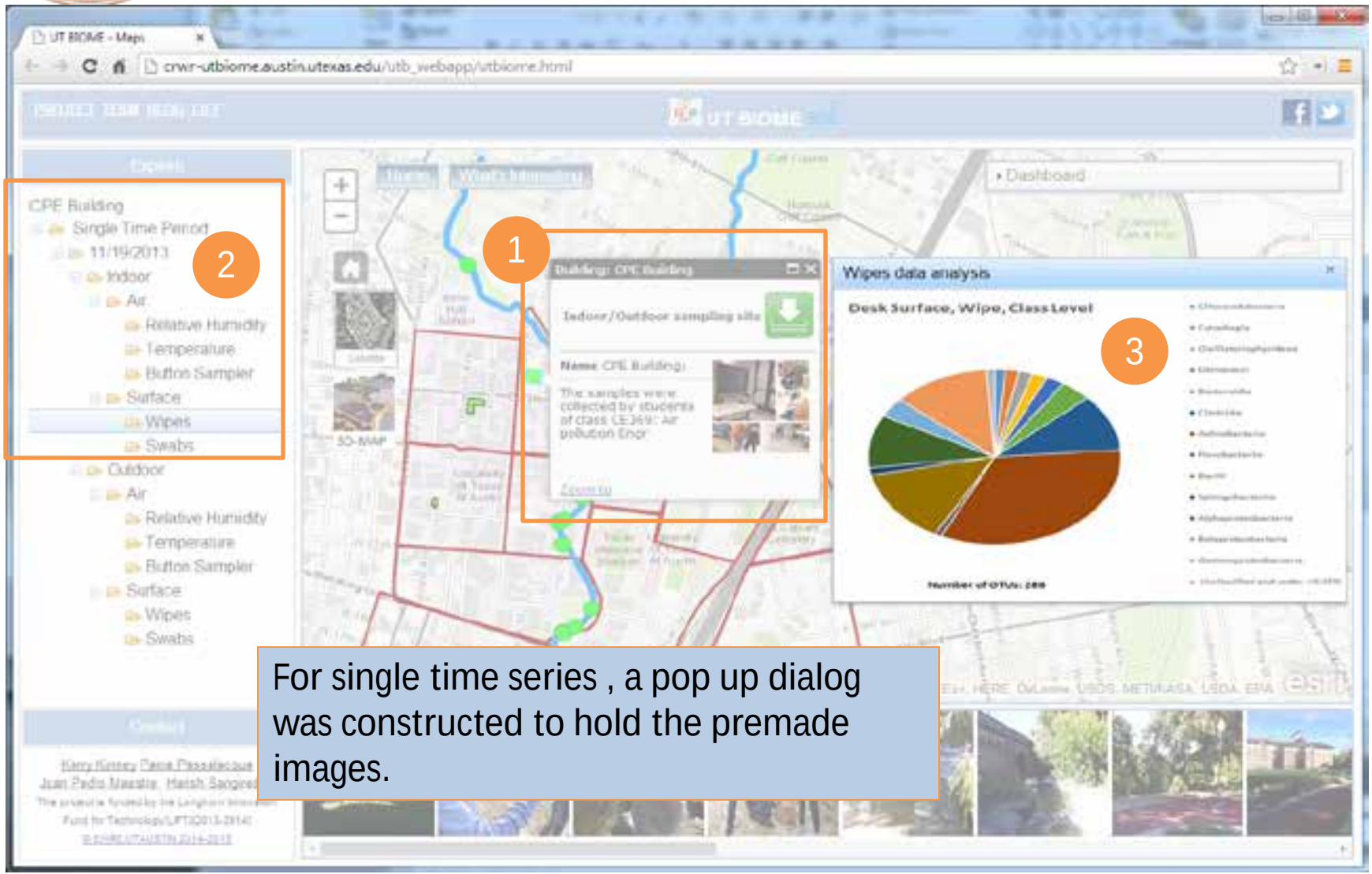
http://crwr-utbiome.austin.utexas.edu/utb_webapp/utbiome.html



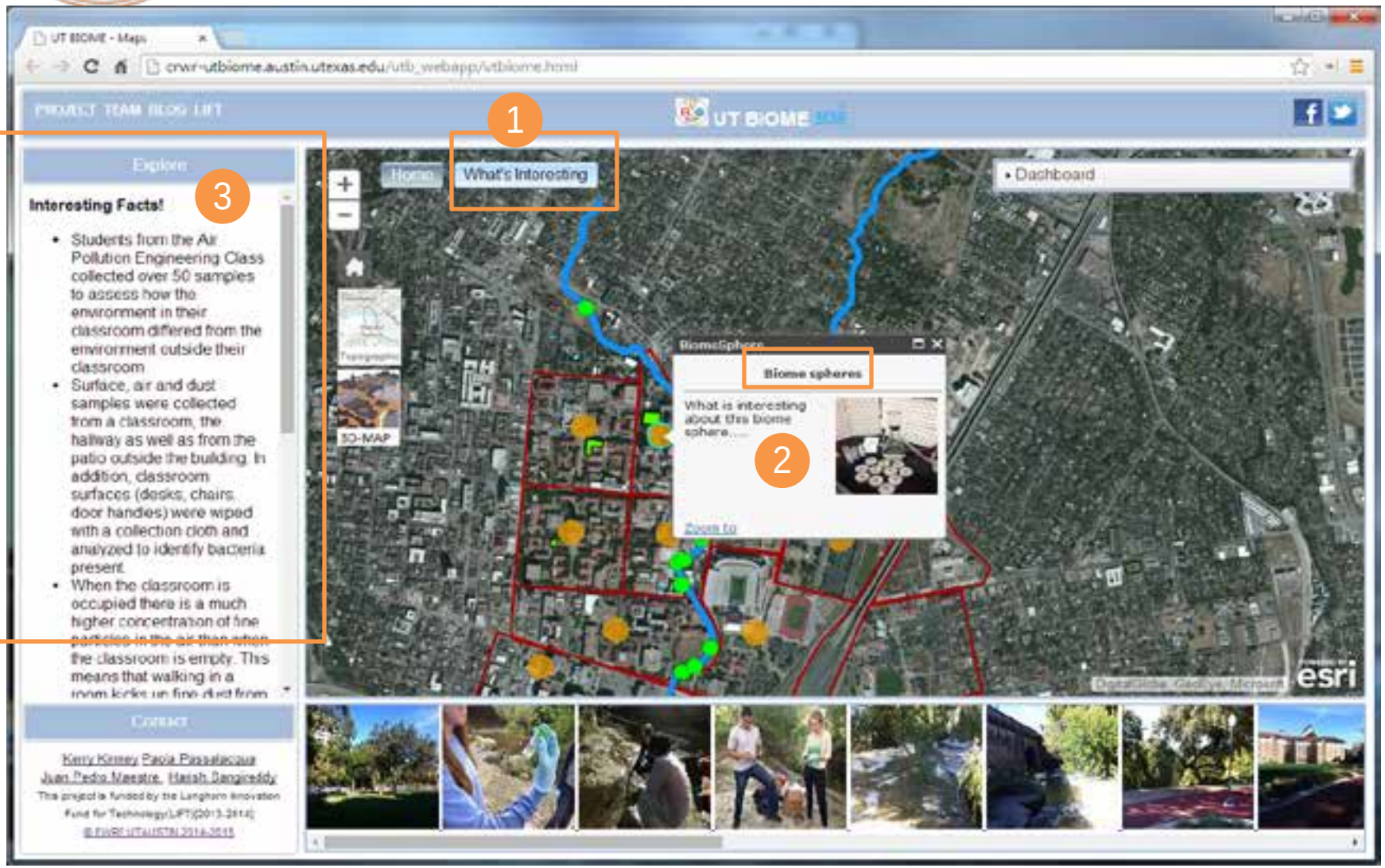
UTBIOME MAP components -1



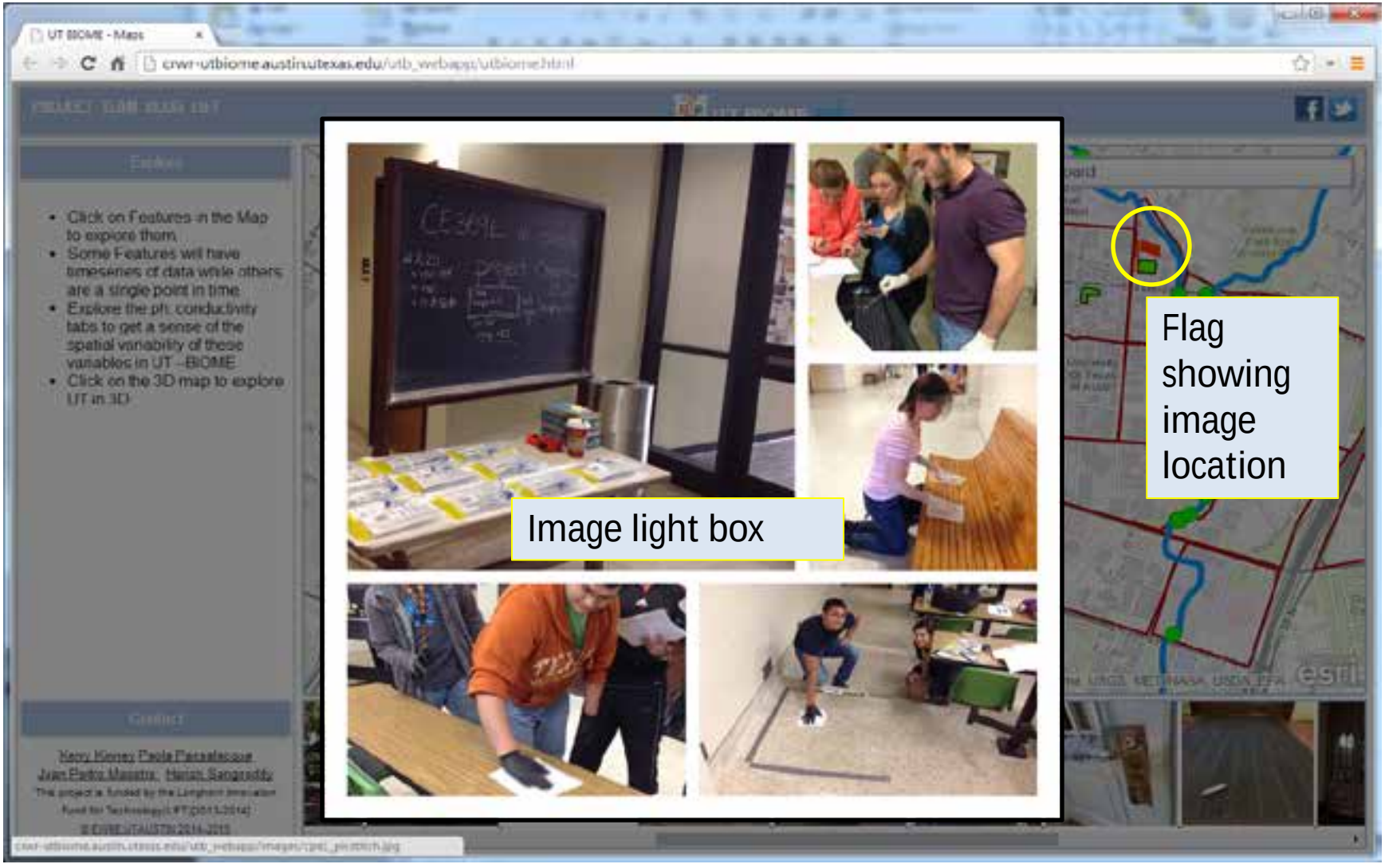
UTBIOME Map components -2



What's interesting: Biome spheres

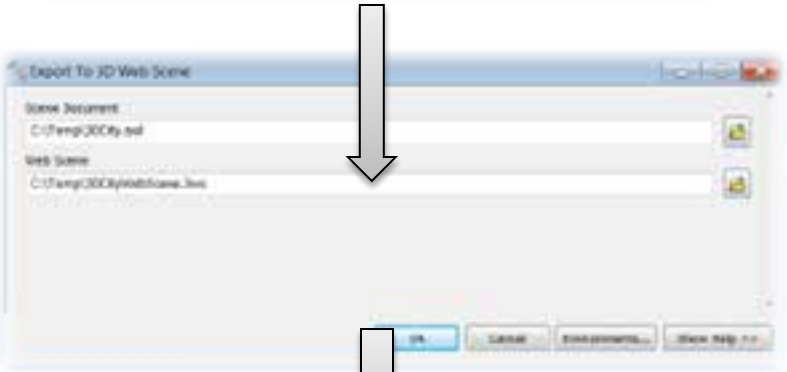


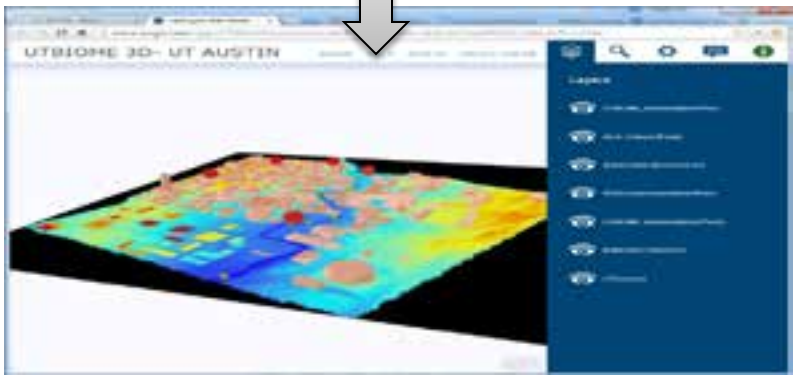
UTBIOME – Image Gallery



UTBIOME – 3D

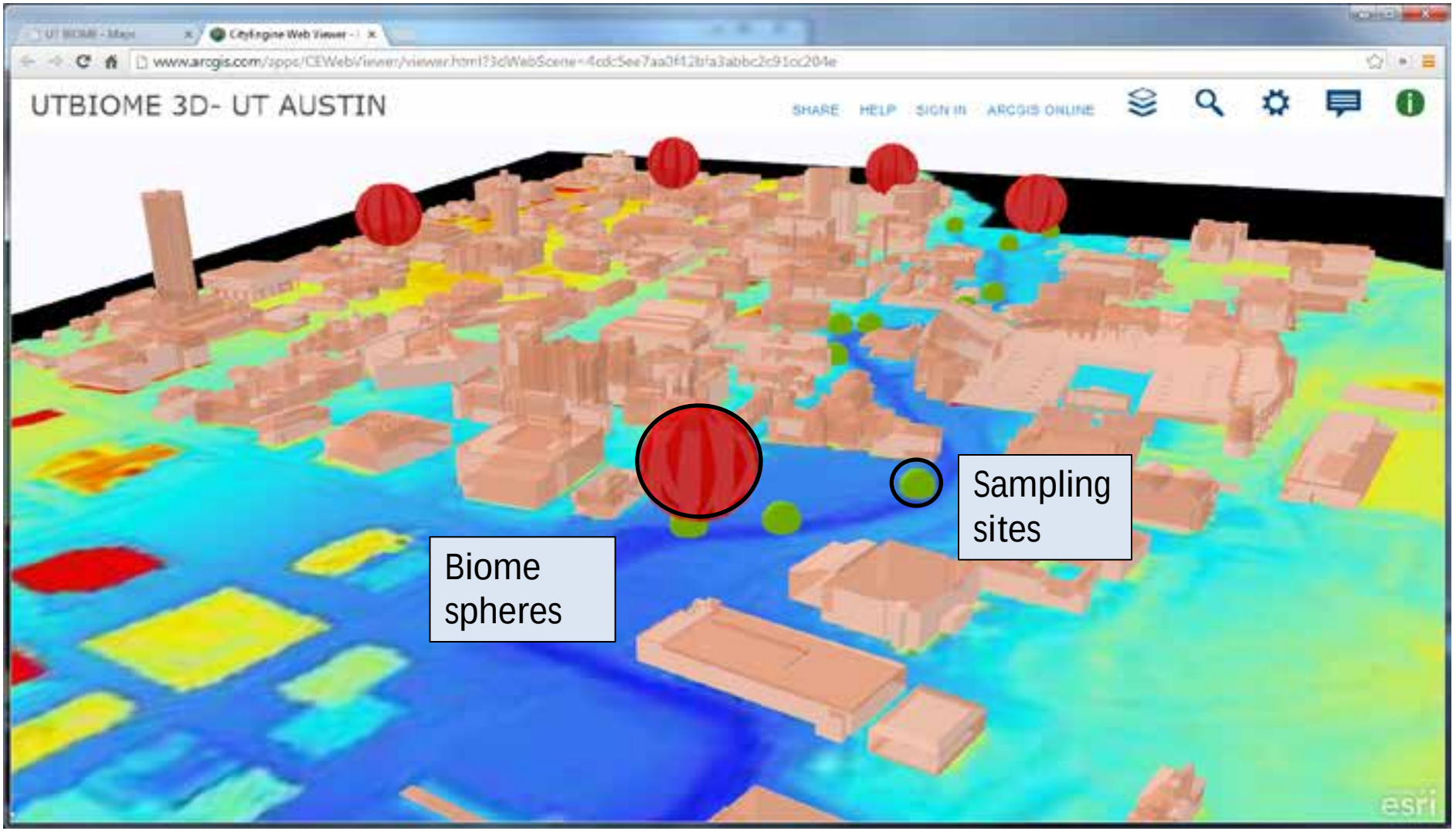
- The 3D buildings were obtained from City of Austin as KML files. ftp://ftp.ci.austin.tx.us/GIS-Data/Regional/coa_gis.html
- The KML files were converted into Multipatch objects using ArcGIS desktop.
- The lidar elevation raster was acquired by Mandli communications and made available to UT Austin students and faculty as part of the Digital campus initiative.
- The 3D scene was created in ArcScene and was converted to a 3D web scene using the export to 3D web scene Geo processing tool. http://downloads.esri.com/support/whitepapers/ao_/J10223_Exporting_ArcScene_Docs_to_3D_Web_Scene.pdf





UTBIOME in 3D

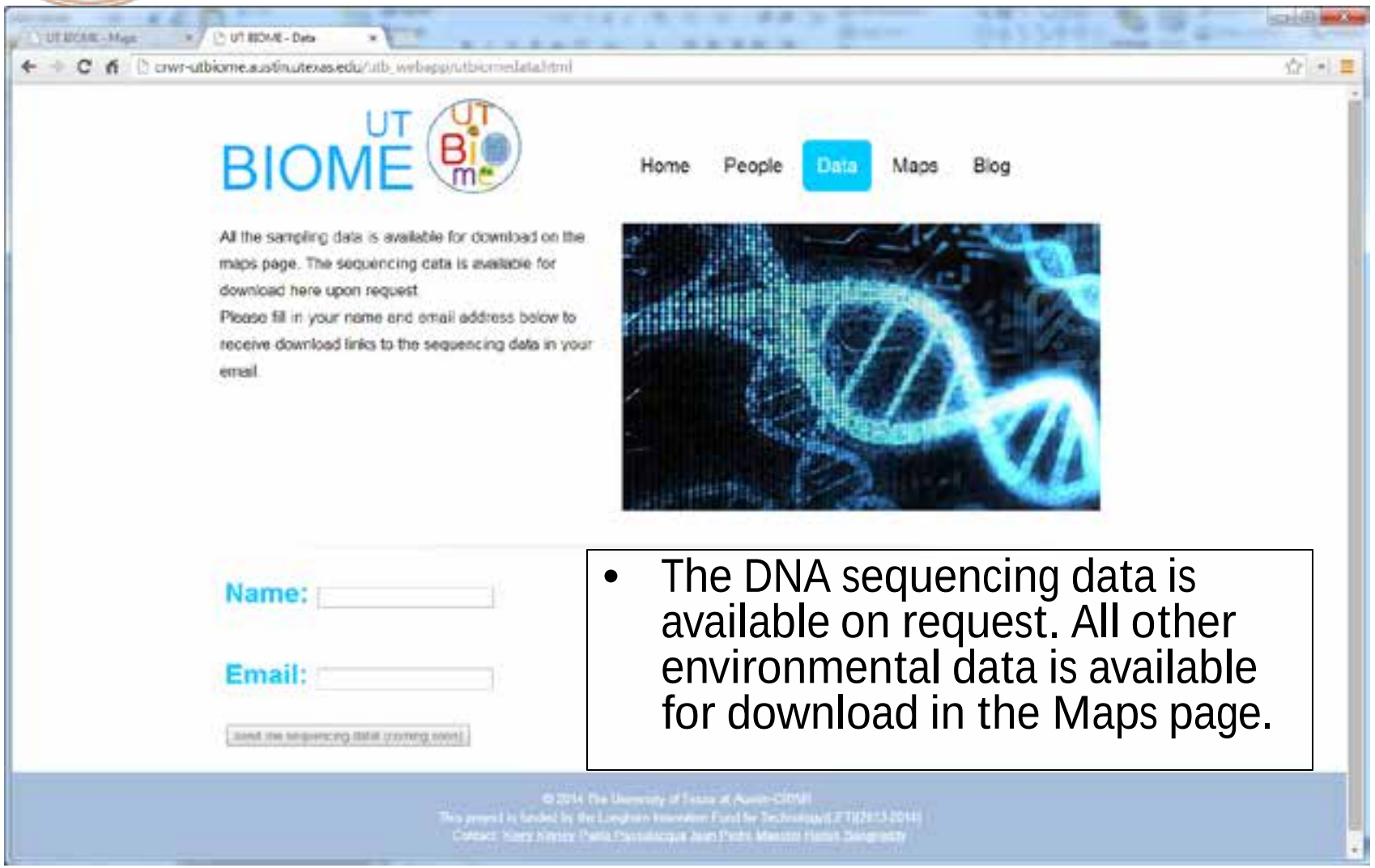
http://www.arcgis.com/apps/CEWebViewer/viewer.html?3dWebScene=4cdc5ee7aa0f42bfa3abbc2c91cc204e



UT BIOME - Home

http://crwr-utbiome.austin.utexas.edu/utb_webapp/utbiomehome.html

UTBIOME Data



- The DNA sequencing data is available on request. All other environmental data is available for download in the Maps page.

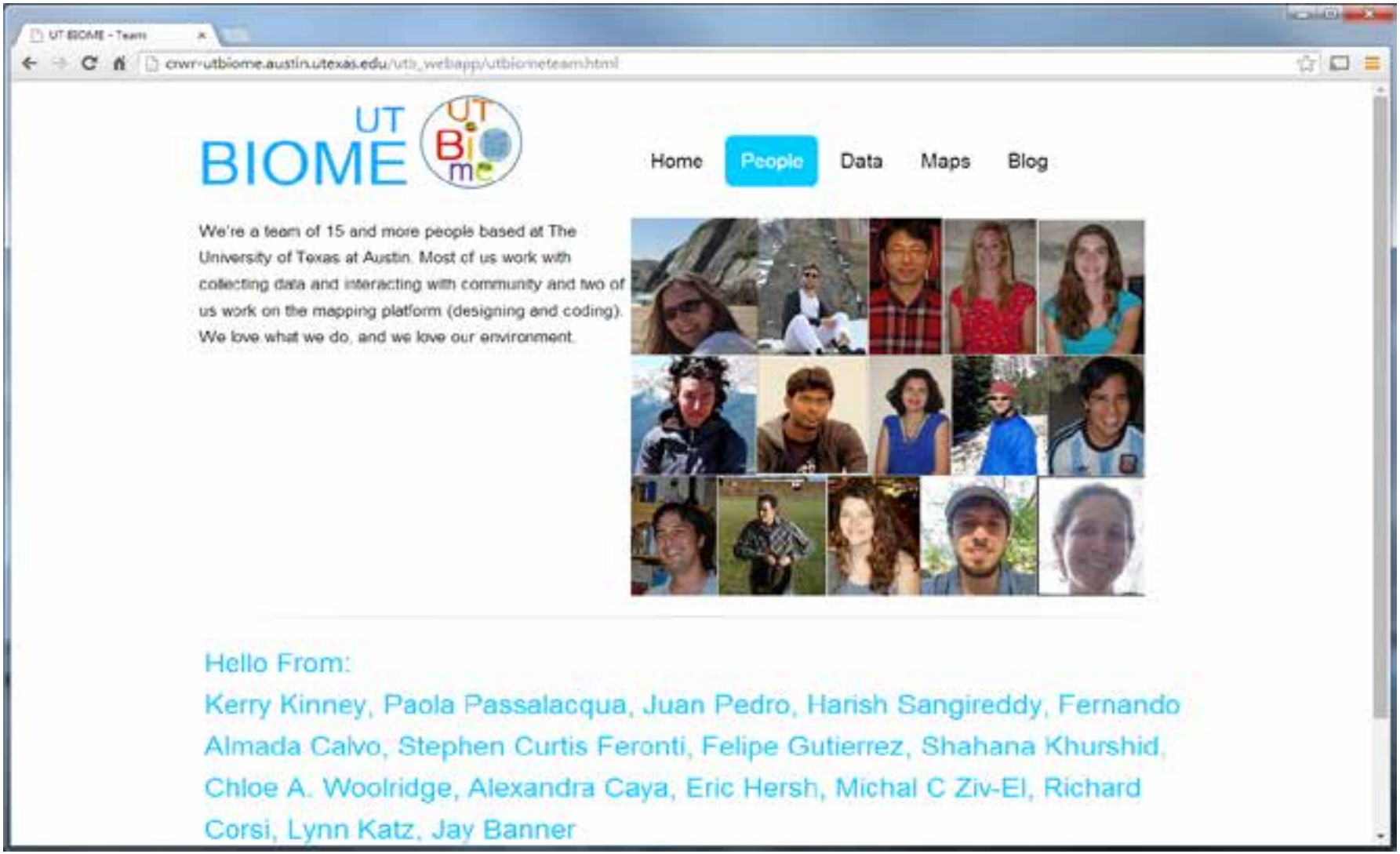
UTBIOME -Social Media

Twitter.com **@UTBiome**

Facebook.com/**UTBiome**

UTBIOME - Team

http://crwr-utbiome.austin.utexas.edu/utb_webapp/utbiometeam.html



Conclusion and Future

- Expand Engagement Across Campus and Beyond to City of Austin and other Campuses – Partners?
- Bridge Gap between GIS framework and BIM framework with visualization tools.
- Extend Scope to Map Other Sustainability, Energy and Health Metrics.