

# GIS for Landscape Management

## Technology Seminar Information Product Description

### Summary

#### Leadership & Administration

##### **Final Construction Documents & As-Built Drawings**

Deliver construction documents and as-built drawings of new work to database manager. Not the same accuracy as a true survey, but more as a good graphic reference for future utility work. PDF format.

##### **Survey Updates by Work Site**

Once a work site is surveyed for a specific job, update GIS base information with ground-truthed survey. Develop coverage of survey areas, when surveyed, and by whom.

##### **Landscape Design Deliverables – Natural & Cultural Resources**

GIS coverages to be clipped to a limit of work line and exported to CAD including soil, topography, storm drainage, irrigation (with PDFs for sprinkler and valve standard specifications), archaeology sites, endangered species habitat, trees, electricity, etc.

##### **Comprehensive Hydrologic Model**

Show all water, groundwater, wells, recharge areas, storm drains, sanitary sewer, potable water, wastewater, treatment plants, surfaces, discharges. Need to be accountable for discharged water quality into Putah Creek and water quality improvement measures in Arboretum waterway.

##### **Stakeholders – Who Has Data & Who Needs It?**

Who are the entities in your community already mapping? Communication collections with scale at multiple GIS levels – city/aerials. Data access issues – income generating. Be aware of issues to purposely avoid.

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<b>Emergency Management</b>
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For planning and response to emergencies, include hazard analysis both chemical and animal. Integrate communication between city and regions.
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<b>Commuter Index</b>
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Information on where staff lives. Decision to call people in during an emergency depends on where flooding has affected bridges.
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## Facilities & Infrastructure

<b>Tree Inventory &amp; Evaluation</b>
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Map all trees, unique ID, taxonomy, images and value evaluation for quality of trees. Setup maintenance, reduce liability, educational, planning for future construction.
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<b>Campus FDX – Inventory of Buildings</b>
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The FDX includes all attributes related to use, square footage, funding source, date of construction, type of space, etc. Needed for work order system, determination of occupied space, emergency planning, etc.
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<b>Campus Soils Map</b>
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Digitize the soils map. Extremely helpful when assigning land for teaching and research.
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### **Campus 3D Wells & Aquifers**

3D view of campus wells and percolation zones. Attributes included should be static water levels, shallow, intermediate, and deep aquifers, and pump details.

### **Roads**

Show paving condition index, date of last maintenance, traffic index rating. Need a visual plan to obtain funding for maintenance.

### **Facilities & Infrastructure Work Order Maintenance History**

Building location including, buildings, fences, benches, gazebos, etc. Access points, environmental conditions, hazards, uses of buildings, what the building is made of, etc. Bar coding equipment, budget, etc.

### **Utility & Irrigation Database**

Provide clear information to identify systems that are installed and future. Including maintenance information that is up to date.

## Museum & Plant Records

### **Distributed Botanical Garden Database**

Intended to be a virtual database based on live connection to participating botanical gardens with optimal dynamic cache, upon which applications (query interfaces, data quality assessments, visualizations, etc.) can be based. See original sheet for more information.

### **Data Usage Tracker**

Intended to track access to data. Takes form of a query interface against access logs, in which the question asked, request source, date of request, count of records returned, etc. are stored. Organization can make an assessment of how the data are used.

### **Arboretum Collection Search for Researchers**

Web-based query where researcher can search by family, genus, species, geographic origin, and wild collected status to generate a list of plants and a map of their locations (possibly photos too). Benefits: facilitate increased research use of Arboretum.

### **New Taxa Report**

List of new taxa for each year along with a map and images.

### **Taxa Quantity Report**

List of taxa represented by various quantities like 0-5, 10-20, 20-50, 50-100, 100+ for current records only. Locate on report by grid or team area or by collection. For collection development and maintenance priorities.

### **Current Bloom Report**

Map, report, and images of what is in bloom by taxa, collection and exhibit area. Allows volunteers and staff to assess for publications, tours, and other interpretation. For identification, verification, and inventory opportunities.

### **Taxa Conservation Coded Plants Report**

Map and report of conservation coded plants by taxa, collection, area, survey status, and how many represented.

Benefits include compliance with regulatory organizations, setting propagation priorities, sharing info with other organizations for global conservation efforts.

#### **Inventory Priorities**

What and where to inventory based on last inventory date. Priorities based on conservation value, provenance value, if in collection, if on tour, or if sparsely represented.

#### **Greenscape vs. Hardscape Analysis & Interpretation**

Aerial photographs supporting reports of historical versus current inventory of plants versus hardscape, possibly broken out by growth habits. Aids in long term planning, erosion control/runoff issues, spurs donor development for horticultural stimulation.

#### **Taxonomic Inventory Based on Location**

An inventory list based on attributes and spatial location. Collection analysis tells us what we have and how many. Benefits: empowers staff and allows for a more fluid information exchange of information.

#### **Inventory List Based on Phenology & Spatial Location**

Basic to providing seasonal maps and list of plants based on flowering, fruiting, etc.

#### **Inventory List Based on Descriptive Attributes & Spatial Location**

Useful for researchers to make maps of wild collected plants that they would use for research and education.

#### **Inventory of Actual & Potential Memorials & Commemoratives**

This would be a very useful tool for donor stewardship and potential donor stewardship.

## Education & Interpretation

### **Event Setup Maps**

Setup maps for different types of events (sale, weddings, educational, musical, etc.) at different sites (Wyatt, Terrace, Nursery, Gazebo) with different audiences (15, 50, 500 people). Benefits: efficiency, volunteer leadership in events.

### **Physical Feature Maintenance**

This product would have an inventory of physical feature like memorials, visitor-comfort amenities, interpretive signs, plant labels, and show location, photo, and maintenance needs/schedule, and could be tied to a work order system or weekly/monthly maintenance lists. Huge benefit for tracking and maintaining features.

### **Physical Feature Planning Tool**

The ability to mark proposed locations on a map in situ so you could have others review it later by handheld device. Benefits: saves staff time in having to generate hand drawn maps with locations on it.

### **Training Tools**

Product to be used by outreach coordinator to facilitate training of volunteers and undergraduate inters who will give naturalist tours. Output includes maps with plants of interest to tour theme. Lists could be generated with plant names and attributes, activities to use in teaching around particular plants,... more on original sheet.

### **Plan Your Visit – Design Your Own Self-Guided Tour**

This product will allow people to develop a visit-based on their interests and needs. It would include photos, maps, plant lists, historical, and other features that could be highlighted. Web-based information could be cross-

referenced to tailor the experience to specific audiences.  
See original sheet for more information.

#### **Student Projects Layer**

Digital files of student projects linked to collections. Eg: writings, essays, LDA projects, design projects, geology student data with waterway, wildlife observations, photography, podcasts, videos, etc. Searchable from internal use only and shared with other faculty and students. See original sheet for more information.

#### **Plant & Collection Tags for Education**

Tag selected plants that are used in teaching (stops, exhibit objects, major specimens) with info such as All-Star designation, All-Star sign, maintenance instructions related to education, educational themes for each collection. Also linked with podcast or other digital media about plant of collection. Benefits: All staff see value of particular specimen.

#### **Teaching Landscape Map & Descriptions**

Maps identify specific pull-outs, gathering areas, performance venues, research stations, and tour stations for both internal and educator use. Helps them plan visit or teaching goals and maintenance of these spaces.  
Benefits: classification of educational importance, coordination, ADA and safety awareness, visitor support.

#### **Faculty Maps & Databases for Teaching & Research**

Faculty tailor useful maps and lists for teaching research. Search topics (habitat areas, native plants, taxonomic) and generate maps, photos, lists, and archival information.  
Benefits: usefulness to student learning and faculty use of collection.

## Collection Planning & Maintenance

### **Tree Inventory**

Intended for use primarily by operations and maintenance to establish both daily operations (work orders) and long-term goals of the urban forest. The inventory would be in the form of a map with a layer for aerial photo, buildings, roads, pathways, irrigation, and trees. See original sheet for more information.

### **Collections Planning**

Maps and lists to be used for snapshots of existing plantings with accession numbers, links to wild/cultivated, link to educational use and wildlife benefits. Also code plants for water needs if possible. Link to research in garden active and historical. Benefits: better collection quality, able to determine planting needs in support of education.

### **GIS for Nursery Sales Planning**

Using BG-BASE link to nursery map. Use for quantities and space use in nursery. Too time intensive? What about online database for plants for sale, photos, collection location, characteristics, cultural needs? Benefits: revenue, improve quality of sale stock, less work, accurate work planning, improve customer knowledge.

### **Irrigation Information**

For irrigation maintenance and repair, map all irrigation lines, valves, quick couplers, and heads in map format.

### **Plant Maintenance**

Accessible zone maps of collections with ideal plant visuals and detail of specific culture, shape, pruning techniques, curatorial value rating. Accuracy in plant care and selection.

### **Visual Plant Maintenance**

Pictures of plants as they should look (perfect specimens) with info on characteristics, pruning, maintenance, water needs, special needs, a 3D image of top and root structure would be nice. Benefits: better care and maintenance of unique plants.

### **Pest Management Mapping**

By creating layers of data relating to location, timing, degree, and species of pest you could better predict and diagnose future and existing plant pest/disease issues and see if other layers in the GIS affected plant pests. Benefits: could shed new light on pest and disease cause and effects.

### **Temporal GIS**

By seeing what plants and land uses previously existed can inform current plant selection. If a taxa has failed several times in a spot, do you plant it again? Benefits: good storage spot for old maps