Why Does the Zoological Society of San Diego Use G.I.S.?

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Abstract

Since the inception of the San Diego Zoo 90 years ago and subsequently the Wild Animal Park, there have been continual changes to their infrastructures from utilities to animal enclosures. This dynamic environment has been recorded for the most part either by memories or outdated maps and documents. With approximately 1,000 acres combined of the Zoo and Wild Animal Park there was a need to know where all of their features were and to be able to use that data for planning, analysis, and conservation efforts. G.I.S. technology and GPS field data collection was employed as a means to bring the Zoological Society of San Diego (ZSSD) up-to-date. Over the past few years, many features have been mapped comprising of basemap, plant, utilities and various other databases. G.I.S. data has been an important part in planning, and an essential source for geographic data and will continue to be a cost-saving solution for the ZSSD.
Purpose

- Wild Animal Park - Sewage Treatment Plant
  - Map potable vs. grey water

- AAM Accreditation (1993) - Living Museums
  - Map plant and garden collections: Zoo (9) WAP (6)

Infrastructure

- Things are old. Things move.
  - Systems built on top of each other
- People get old. People move.
  - Information based on memories
Methods

People

- 5-year ESRI software grant (2001) for Association of Zoo Horticulture (AZH)
  - “North American Zoos, Aquariums and Botanical Gardens”

- Consultant, 2 Interns, ZSSD personnel
  - 2 full-time GIS Specialists
Methods

Data

Integration

Codes

CAD

Topo

Hand-written notes (cardboard, napkins, guest maps)

Old maps

As Builts

6” ortho $\Rightarrow$ 3”

LIDAR – building heights, terrain analysis
Methods

Data

Collection

- GPS
  - ProXR ➔ ProXH
  - Laser Range Finder

Challenges

- Heavy tree coverage
- Staff coordination
- Guest Issues (Ex: irrigation mapping, laser)
Methods

Collection

Challenges (cont’d)

- Animal Issues
Results

- Geodatabases
  - Botanical
    - Collection plants and gardens
  - Utilities
    - Water, Gas, Electrical...
- IMS (Zoo intranet)  ➔  ArcGIS Server
- Irrigation
  - Valves, Clocks, Zones
- Basemap
  - Grid, Buildings, Exhibits, Guest Experiences, Roads, Perimeter Fence...
Old Map with Codes
New G.I.S. Basemap
Water Mapbook (Wild Animal Park)
Uses

Planning
- New exhibits
- Bus routes
- Special events

Maintenance
- Map construction zones
- Valve replacement & relocation
Uses

- Emergency
  - Roads
  - Fire Hydrants
  - Perimeter Access

- Conservation (CRES)
  - Rattlesnakes - CA
  - TCI Iguanas - Caribbean
  - CA Condors - CA
  - Tuatara - New Zealand
  - Black Rhino - South Africa
  - White Rhino - South Africa
Uses

Departments

- Horticulture
  - Inventory
  - Tour maps

- Animal
  - Exhibit area
  - Enclosure codes

- Construction & Maintenance
  - Infrastructure mapping
  - Planning
Uses

Departments

- Development
  - Donor plaques
- Architecture
  - Basemap, utilities data
- Buildings & Grounds
  - Trash cans
Benefits

- Safety and health of guest and animals
  - Sewer vs. storm water lines
  - Treated vs. potable water
  - Emergency planning
Benefits

**Time**
- Locating a feature in the event of an emergency (ex: shutoff valve for water line break)
- Labor saved for other projects

**Cost**
- In-house mapping vs. hiring outside surveyors
- Digital data eliminates outsourced printing
- Data sharing (ArcServer) reduces duplication for different departments
Future

- ArcZoo Data Model
- Internet
  - 3-D fly-throughs
  - Interactive maps
- Kiosks
  - Custom tour maps
- Work order system
  - Construction & Maintenance
Future

- Conservation projects
  - Bird disease tracking
  - Seed Bank
    - (Vegetation, seed collection mapping)
  - Andean (Bornean Sun) Bear

[CR&S Logo]
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