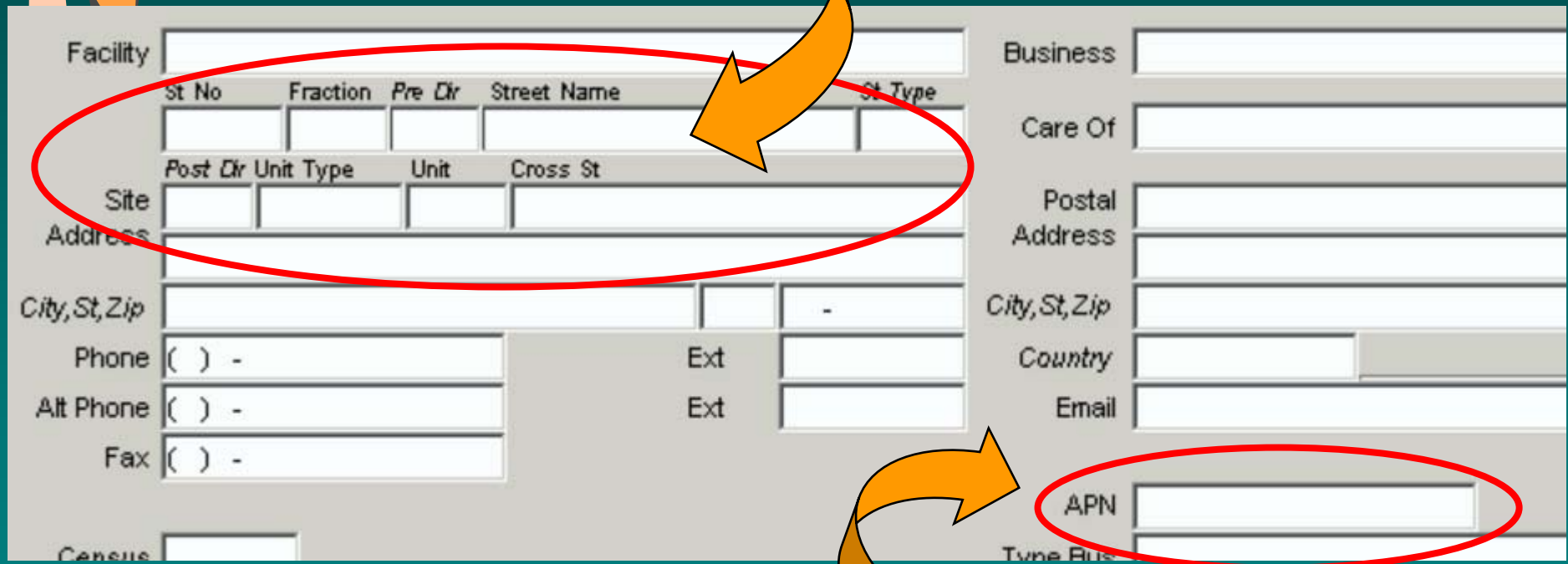
Capturing Geographic Data

- Hidden Geographic Relations
- Global Position System (GPS)
- How to gather GPS Readings
- Other Sources for GIS Data
- Metadata

Hidden Geographic Relations

Addresses



Assessors Parcel Numbers

Linking information

"Linking" additional information to existing records.

Existing Records on the Parcel Layer:

Attributes of Parcels

FID	Shape*	APN	ADDRESS1
0	Polygon	46036062	166 FRANK WEST CIR
1	Polygon	46036052	C/O ABLE RENT A CAR
2	Polygon	46036060	P O BOX 775
3	Polygon	46036045	6197 USHER DR
4	Polygon	46036061	P O BOX 1511
5	Polygon	50012091	3848 BERKESEY
6	Polygon	50012090	P O BOX 113

Additional Information in a Table:

- Name of Landfill
- APN of Parcel
- Address
- Class
- Volume
- Waste Type #1, #2, …
- # employees
- Size
- # door knobs
- …..

Geo-coding

Assign a location to an address

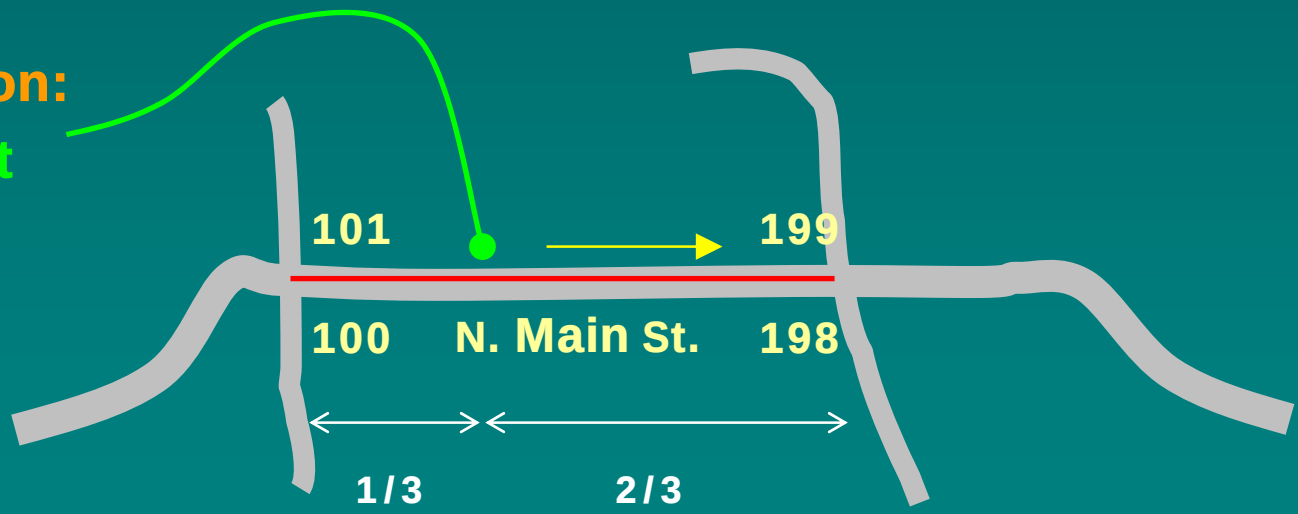
Information in the GIS...

... on the map:
- Street location
- Street direction
- Street segment

... in the table for each segment:
- Street Name
- Right side street number from ...
- Right side street number to ...
- Left side street number from ...
- Left side street number to ...

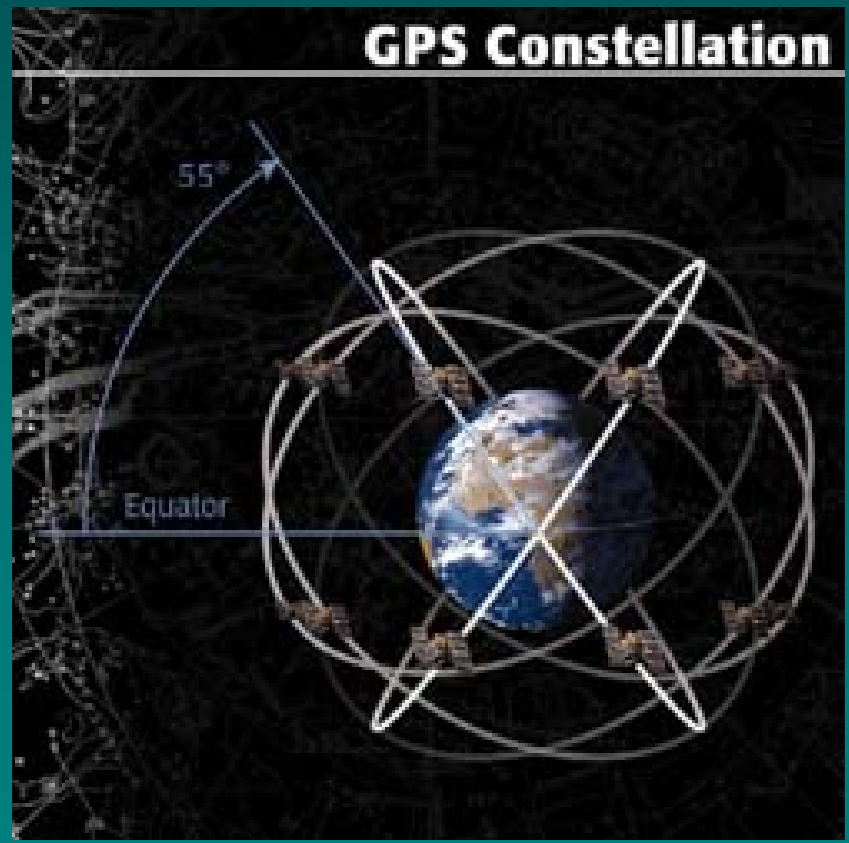
Our information:

133 N. Main St



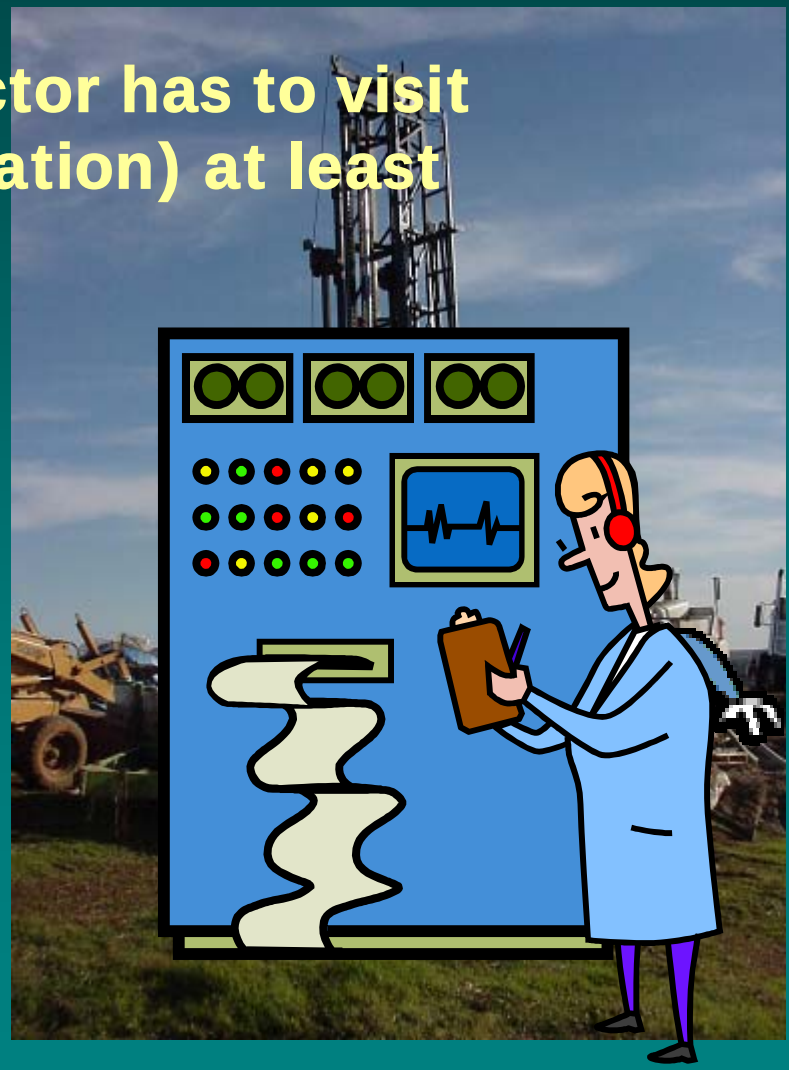
Global Positioning System
GPS

- 24 satellites constantly send signals to the earth.
- With a GPS receiver we can calculate our position according to the satellite signals.
- The accuracy of our position depends on (a) the type of receiver and (b) the quality of the signals received



Global Positioning System
Work Flow

- In most cases an inspector has to visit a site (e.g. a transfer station) at least once.
- While there he/she can take the GPS reading (2-3 min).
- In the office the GPS readings are being uploaded, differential corrected and added to the existing GIS layer (3-5 min)



Global Positioning System

Differential Correction (in a nut shell)

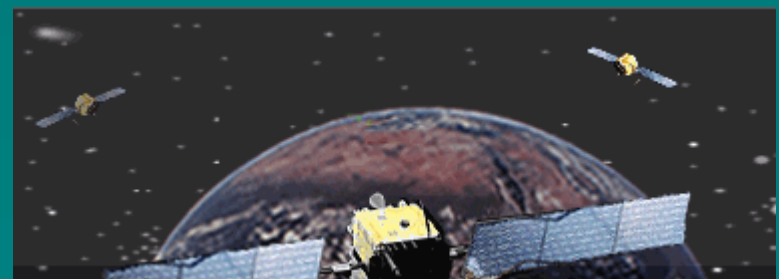
User with GPS receiver

- records the position in a “rover file”

- applies the transmitted difference to the own recorded position and moves the point accordingly

A base station

- records it’s position in a “base file”
- compares the recorded with its known position
- transmits the difference between recorded and known position to user



Global Positioning System

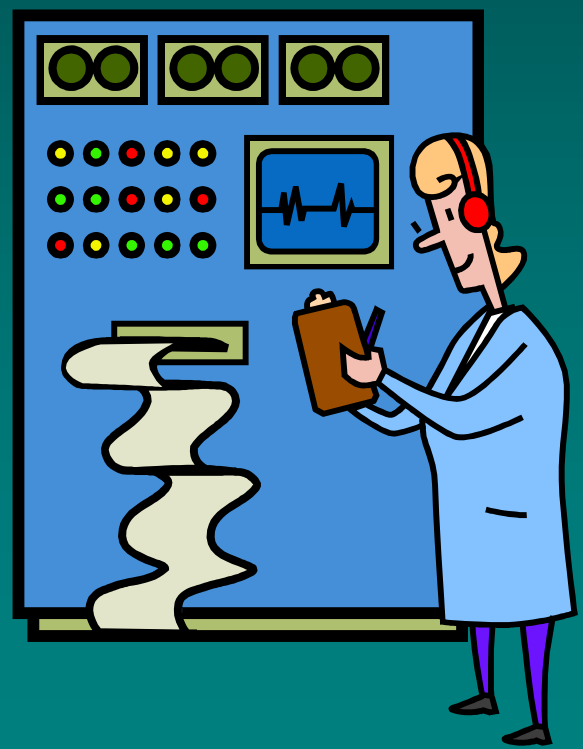
How to obtain GPS readings

What to do NOW?

- In the office the GPS readings are being uploaded, differential corrected and added to the existing GIS layer (3-5 min)

We have three options:

- We were using a GPS device running ArcPad.
- We were using a GPS receiver with Trimble TerraSync.
- We used any kind of GPS device and created a table with Latitude / Longitude.

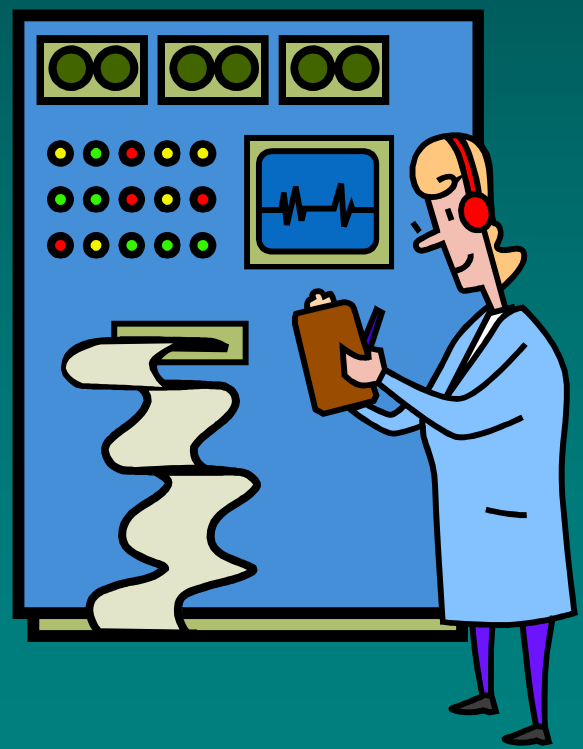


What to do NOW?

- In the office the GPS readings are being uploaded, differential corrected and added to the existing GIS layer (3-5 min)

Two Questions:

- Were we using a GPS receiver
  - with Trimble TerraSync or ESRI ArcPad
  - without any of them
- Do we need Differential Correction, yes/no?



How to get the data into the GIS...

...using ArcPad or TerraSync

In ArcPad and TerraSync we edit the shape files directly in the field. A “rover file” is created simultaneously

Back in the office we have to copy the shape file to the desktop and overwrite the old shape file.

Additional features of ArcPad can only be reached when the data resides in a “Geodatabase”

How to get the data into the GIS...

...using GPS receivers without GIS software

Older Trimble GPS devices create "rover files" in the field with the recordings of the satellite signals. In the office these rover files can be loaded into "Pathfinder Office" and exported into a shape file.

For Garmin GPS receivers DNR has developed an extension to load the positions into a shape file. But the accuracy of locations is limited!

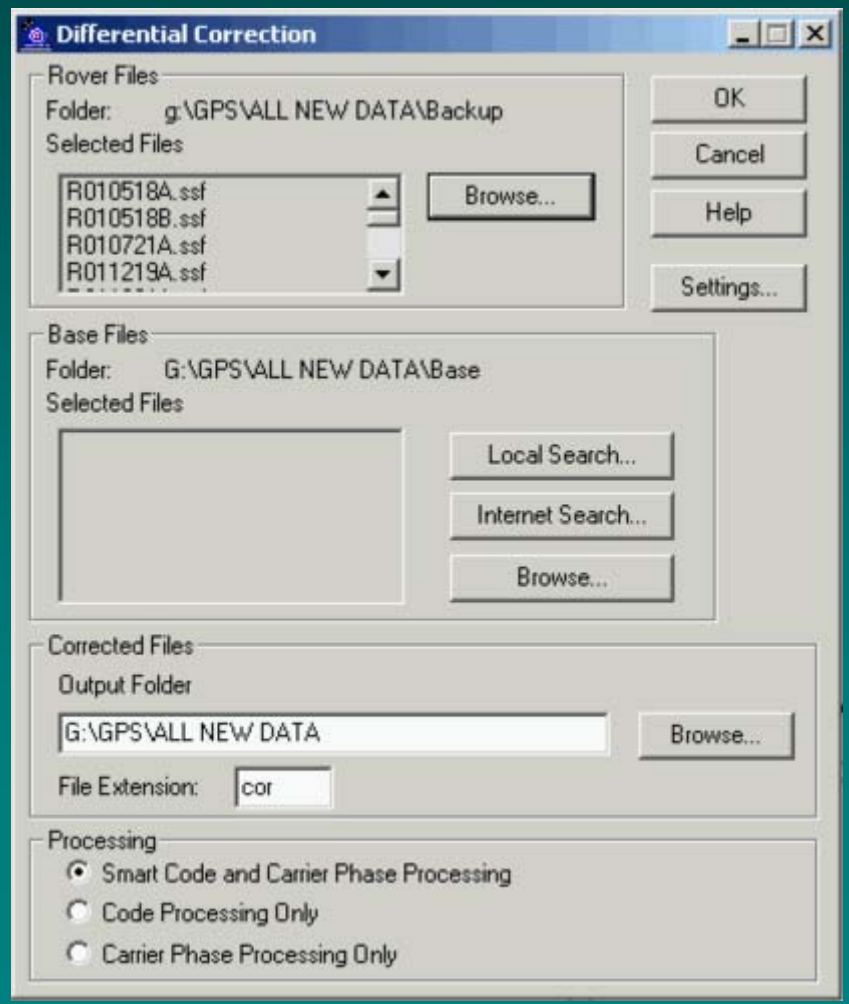
How to get the data into the GIS...

...and perform the Differential Correction

If you are rich and beautiful...

... you can subscribe to an automated service, simply email your rover files to the service.

The rest of us can load the rover files into Pathfinder office, either use own base files or link Pathfinder Office to one of the base stations over the internet.



How to get the data into the GIS...

...using paper and pencil

Every GPS device displays the latitude and longitude of the current location.

wastetireedit.dbf

	A	B	C	D	E
1	LATITUDE	LONGITUDE	ID	TIRES	COUNT
2	38 11 06.26327	-120 55 43.6604	1	3000	estimate
3	38 06 48.96670	-120 53 53.9913	2	400	estimate
4	38 10 55.55881	-120 53 11.2066	3	800	estimate
5	38 06 01.83589	-120 42 07.1624	4	134	count
6	38 03 24.98368	-120 39 20.0124	5	203	count
7	38 10 46.81088	-120 56 09.8727	6	42	count
8	38 11 13.92958	-120 37 05.8719	7	12	count
9	38 05 50.47354	-120 52 27.6289	8	200	estimate

You can edit a table with latitude, longitude and additional fields.

In GIS you can create a shape file using this table – as we will see later on!

Other sources for GIS data

(or: How to let others do the work)

Look for data within your county:

Most likely...

... the Assessor has a parcel layer

... Public Works has a road layer.

Or the other Departments have data that you can turn into a GIS layer to assist your project.

Other sources for GIS data

(or: How to let others do the work)

Internet sources:

www.geotracker.swrcb.ca.gov

www.geodata.gov

www.fs.fed.us

www.geographynetwork.com

www.geocomm.com

www.esri.com

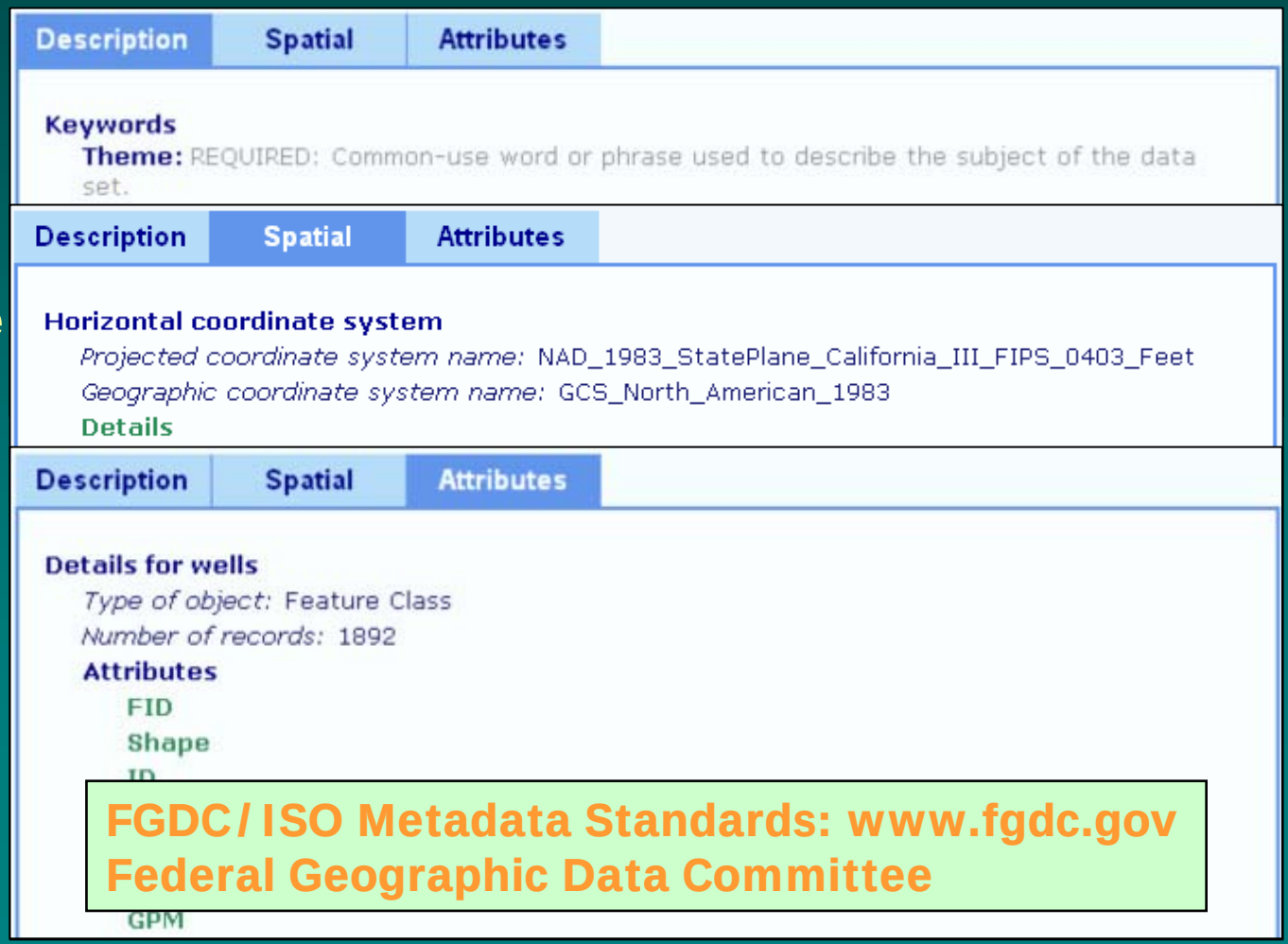
Metadata

... is the data that goes with your data

- Data description
- What are the data good for?
- Disclaimer

- Description of the projection
- Accuracy

- Field descriptions



Part 1