

As the population increases, land becomes more scarce and there is competition for the use of parcels. For example property in the basin may be on the planning boards of several diametrically opposed groups.

City Planners should be directing growth and preserving the character of Arizona and the wildlands.

Transportation – anyone who drove in today recognizes the need for either more effective mass transit or wider arteries leading to the city US 60 I-17 etc. However I don't know where the roads would be placed.

Residential – always an economic engine in Arizona

Small Business – Factories and retail establishments

Crop Production – small islands of truck farms Europe  
Middle East and Asia

Dairy – smells like money

Energy – power plants of any kind

Water Rights – Flagstaff and the ranches for water

Recreation – Water theme park in Mesa and the resort on the old GM test track

### Each has a price tag

The heart of the soil data base is the soil map, or spatial representation of the landscape. It is produced by soil scientists working in the field identifying soil properties and drawing the boundaries of the soil map unit on an aerial photo base. The NRCS has been producing maps for over 100 years and as time goes on and technology gets better and we gain more understanding of soils and how they form and how they react then product gets better.

I work for the USDA and traditionally our customers have been farmers, ranchers and growers. But others discovered the product and began to use it too, The NRCS and Forest Service are the only people doing large scale soil mapping in the US, and our

product is free to the public. Most of my customers are realtors, appraisers, home inspection companies, developers, transportation engineers, and ecoscientists.

Since the 1890's we have delivered our product in book format, with maps, tabular data and map unit descriptions. As a customer we would give you a book with a couple of million acres worth of data and you were only interested in 500 acres. You had to locate your parcel on the map sheet, copy the soil map units, look them up in the map unit legend, go to the tables and look up each unit and decide what data you needed, go to the map unit descriptions to understand the landscape and then write a report based on all of this. It was all good data, just tedious.

The other issues were in the customers understanding the limitations of the map. We tend to think of soil polygons as being "pure" that is if the map says the soil is Trix clay loam, I expect to find Trix where ever I dig. Soils are not consistent across a landscape, because landscapes are not uniform throughout their spatial footprint. Soil typically changes gradually over distance and with depth. But soil may change rapidly due to slope or parent material.

We place soil into units based on inherent physical and chemical properties observable in the field such as, slope, texture, ph, depth, parent material, drainage etc and on dynamic soil properties such as bulk density, soil structure, infiltration rates, organic matter, etc.

### Power Point

- 1 and 2 land is dear when it is rare.
- 3 Agriculture is the only essential industry
- 4 DNA
- 5-8 Soil scientists at work in the field

9 A soil map that is wrong. No matter where we place the line its not really there because due to scale the width of the line is about 80 feet. When we used to ink the lines on Mylar for transfer to a printable product some scientist's would ink a wide line. I could always tell who mapped a sheet by the ink job.

10 The 3 formats of soil survey

11 Old farm plan map

12 Interp map

Finally we move into the 21<sup>st</sup> century with an on line on demand soil map and interpretations. The problem with the paper copy is it's frozen and you may be looking at old tabular data that has better interpretations now that we have a bigger data base to make our predictions from. When you get data off of the web soil survey or soil data mart you are assured the interps are current. They may be 6 months old but not 1970 vintage. It isn't goggle earth or ARC View, but it is user friendly and good.

Essentially this is a data mine, you can go in take what you need and print and leave.

What I would like to do now is demonstrate how you can navigate to an area using different information. I know it is very difficult to learn anything by watching someone else pushing buttons. But I have provided a study guide for you that helps get you started with the keys. I've selected the area near Red Rock, Arizona for several reasons: it's well known, there is a mix of urban and farmland and rangeland, the UofA experimental farm is there and there is a housing community going in.

- a. open WSS <http://websoilsurvey.nrcs.usda.gov/app/>
- b. navigate by town – by zip code – by latitude longitude –  
by section township range –
- c. red rock
- d. 85231
- e. by latitude 32 35 15 longitude 111 22 30 Use  
degrees/minutes/seconds (zoom out)
- f. section 5 and 6, 7 and 8 township 10E range 10S

Open “Legend” – topo map or aerial photo. Do not overlay the soil map over a topo, it gets to be a confusion of lines.



Draw out an AOI using one of the search methods add the soil map  
 a. The total acres are shown and the soil map unit and its total and percent is also shown.

“View soil information by use” \_\_\_\_\_  
 “Urban” then Dwellings without basements”

All the computer is doing is comparing soil physical and chemical properties and qualities and matching them to a specific use. This is evident in building limitations 9 and 10 are combined and 30 and 31 are combined.

Print the Report “Printable Version” or “Add to Shopping Cart” Shopping cart will produce a lengthy document.

**Land Classification** will give you “prime, unique and state wide important soils” this is useful in working with the Federal Farmland Protection Act.

**Soil Properties and Qualities Flooding Frequency** It comes up red – check legend.

**Under “Suitability’s and Limitations” open “Yields of Irrigated Crops”**

**Under “Soil Qualities and Features” open “Dept to restrictive pan (duripan)” very important in construction and farming because if there is a pan it will restrict water movement and root growth.**

**Under “Soil Qualities and Features” open AASHTO use inches for depth**

Farm uses

- a. Ecological Site Assessment – click on a component then select “historic plant communities,” production high and low. Shows annual and perennial grasses and forbs
- b. Water management shows potential for irrigation
- c. Crops
- d. Ranching improvement

SOIL DATA MART <http://soildatamart.nrcs.usda.gov/>

This site displays tabular information without the spatial or map data.

1. Select Arizona and Soil Survey Area
2. Pinal County Western Part – Generate Reports
3. Soils 9 10 30 31 32
4. Range land productivity and plant composition
5. Map unit description brief generated
6. Irrigated Crop Yields

I hope you can see how you can build an evaluation of property based on soil information that is current, accurate and in a professional format.