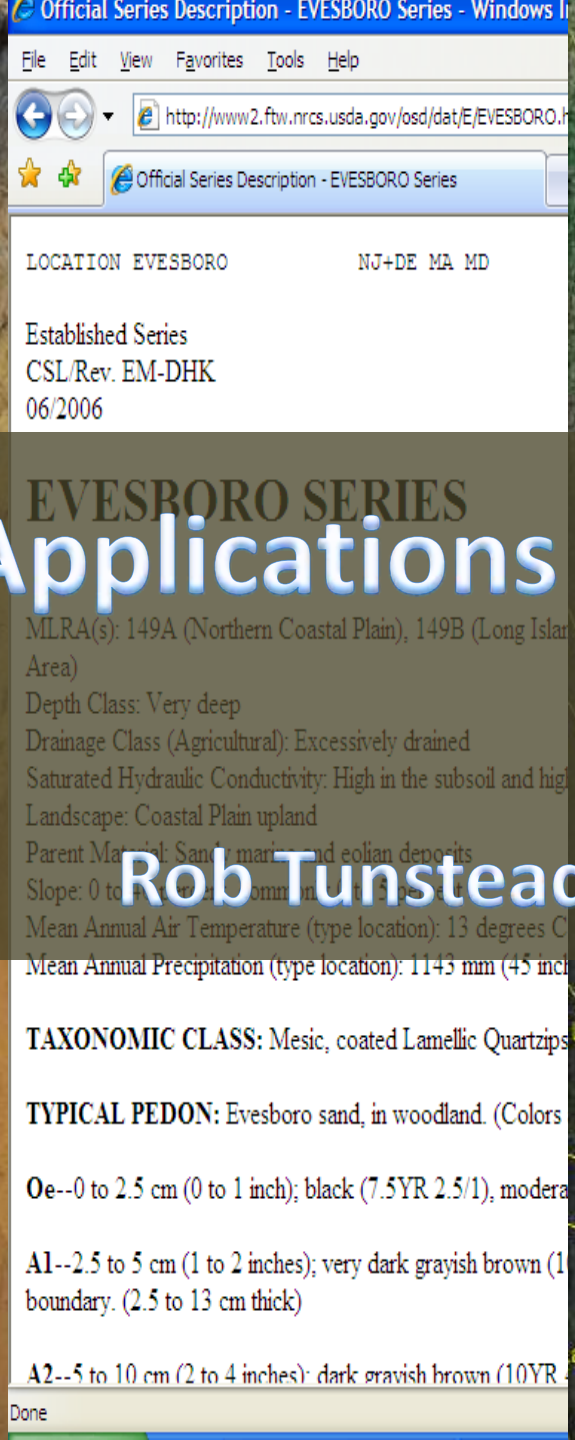
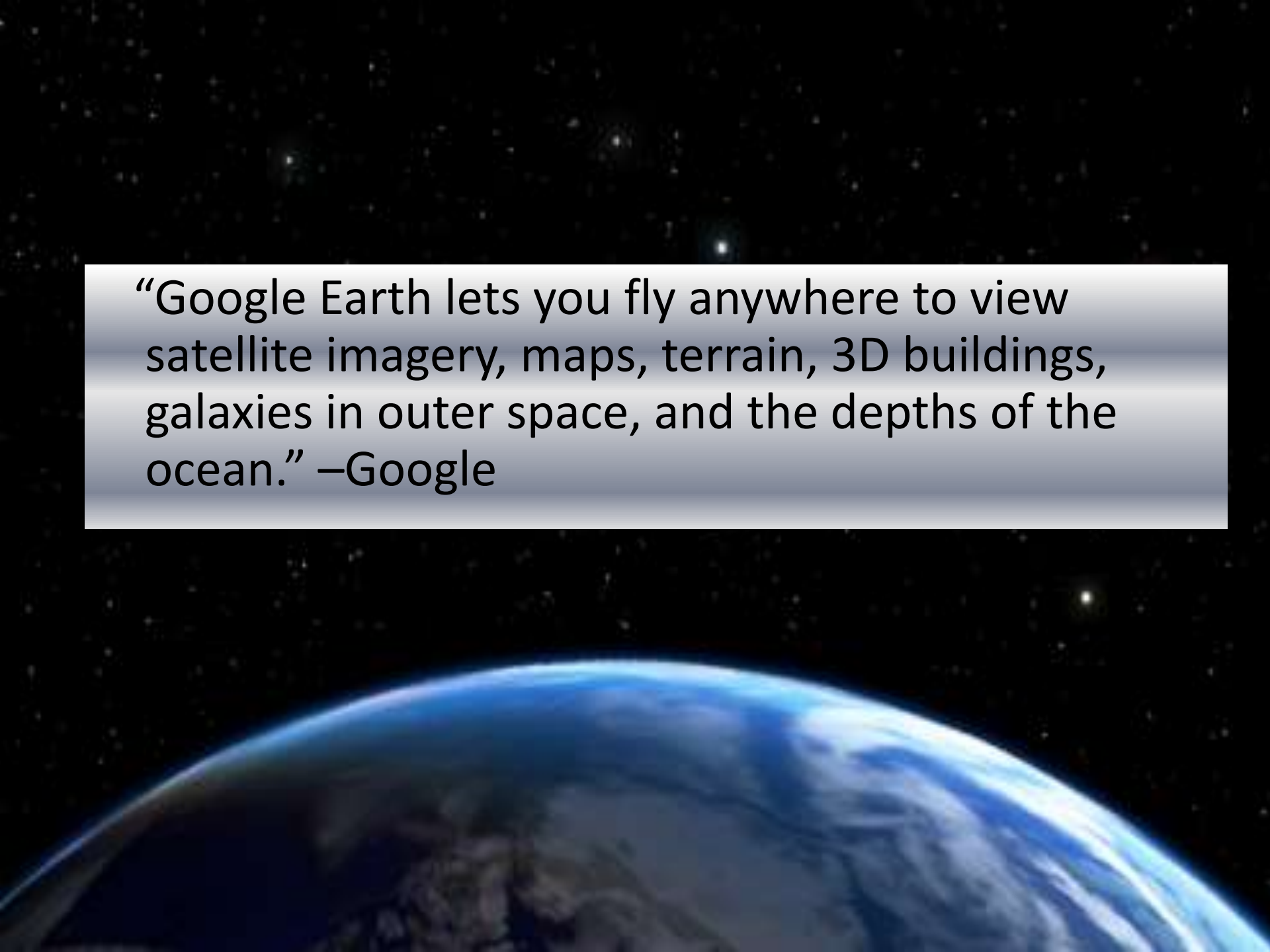
Applications of Google Earth

Rob Tunstead, Katey Buckland

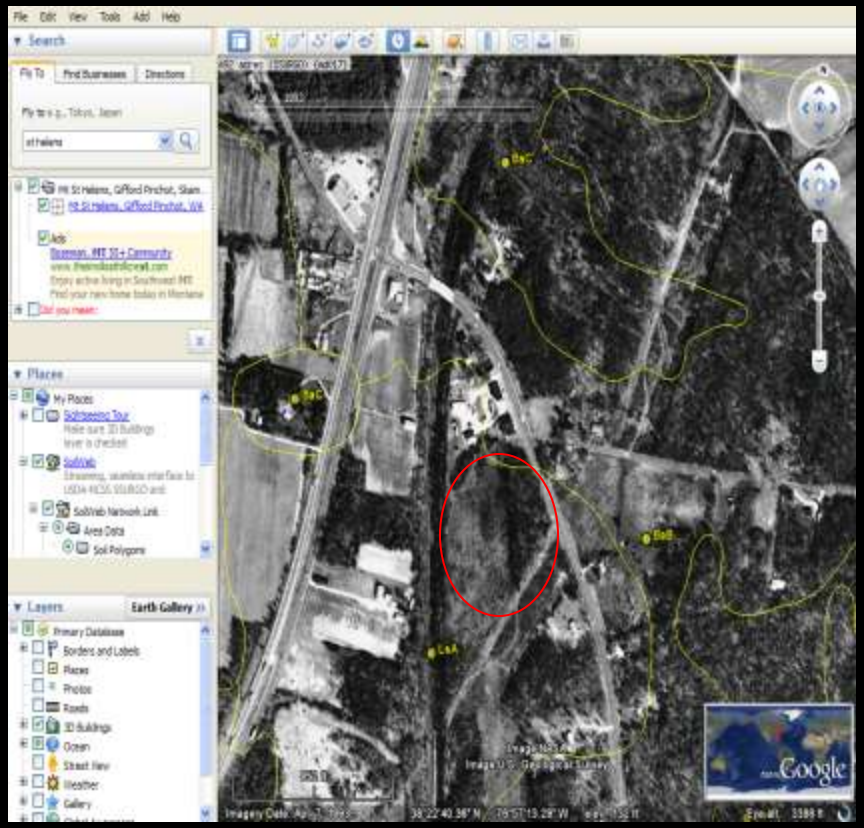


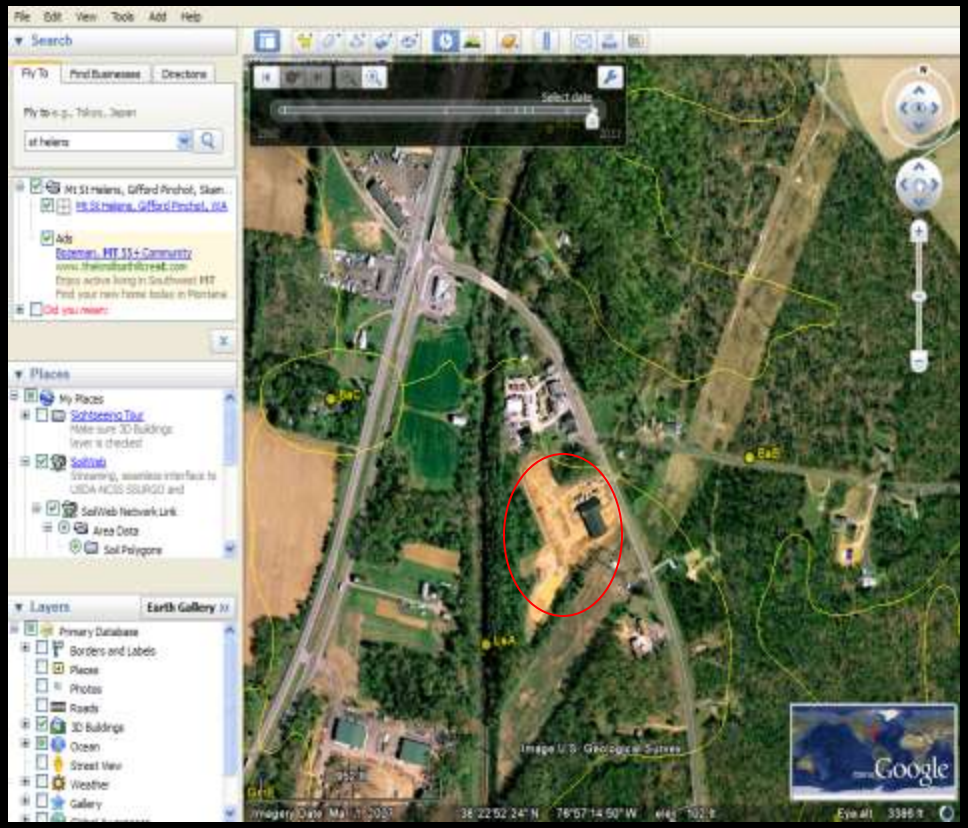

“Google Earth lets you fly anywhere to view satellite imagery, maps, terrain, 3D buildings, galaxies in outer space, and the depths of the ocean.” –Google

Who Uses Google Earth?

- Biologists – Wetland delineations, Wildlife habitat,
- Humanitarians – Emergency response, Mission trip planning
- Foresters – Monitoring forest fires, Deforestation
- Teachers – Visual aid for history, geography, english, etc.
- Travelers and Hikers – Trip routes, places to visit
- Urban Planners – Real Estate Agents, Homebuyers, Developers, Contractors, etc.
- Engineers – Historical use of the property, current landuse, where to install drainage pipes, irrigation lines, etc.
- Soil Scientists – Rapid Carbon Project, Updating Soil Survey, Educate the public about soils
- Military – Plan of attacks, escape routes, how to avoid terrain obstacles, etc.
- Hospitals – Epidemiological studies, improve access to hospitals

HISTORICAL IMAGERY





1993

2011

Tools available to Google Earth Users

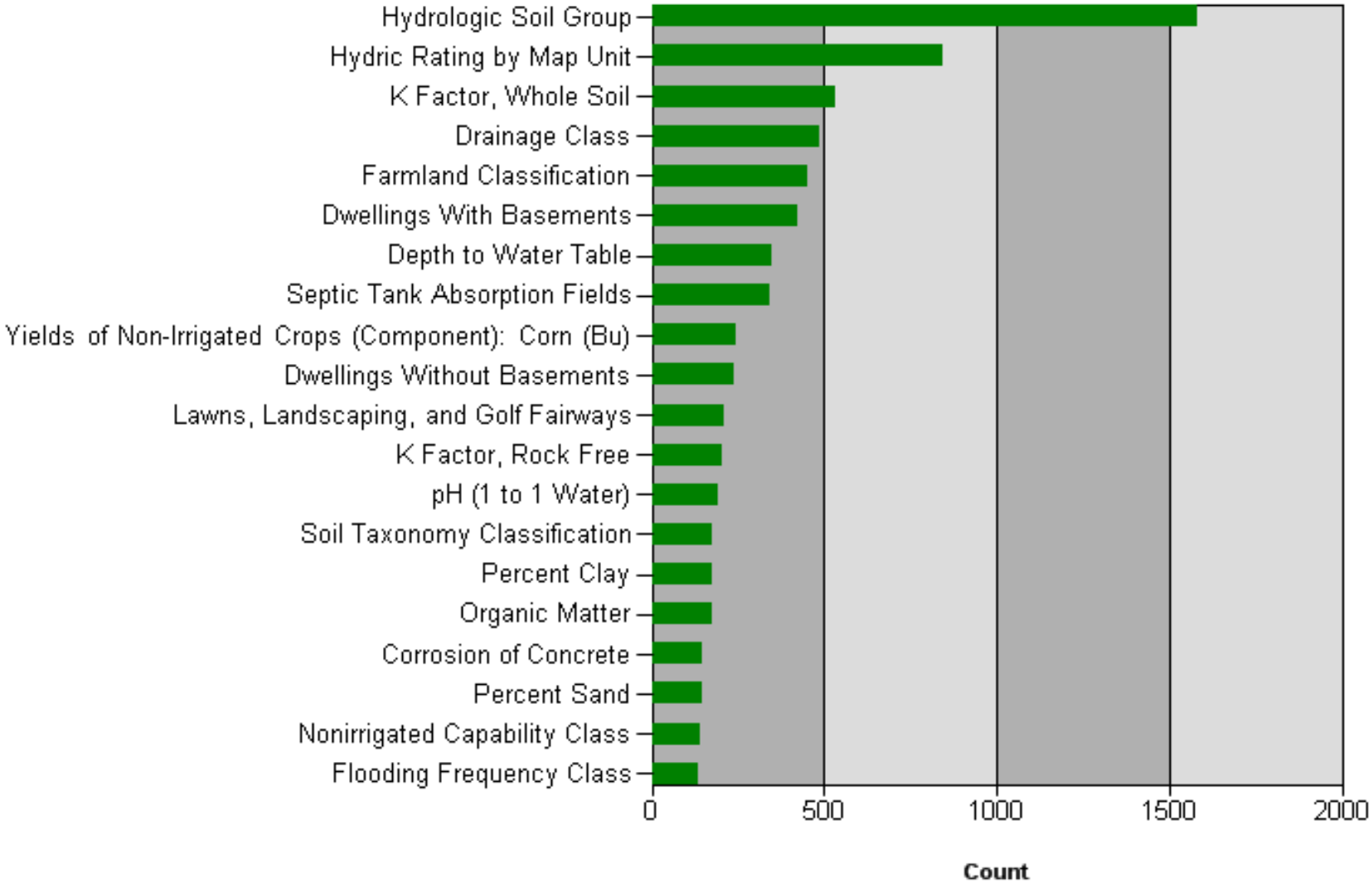
- Ruler
- Points, Lines, and Polygons
- Historical Imagery
- Turn on/off different layers (just like ArcMap)
- Print/Save/E-mail
- View current extent in Google Maps, Get driving directions, Search for nearby businesses
- Record a video
- Flight Simulation
- Import GPS points, tracks, or routes
- Develop and/or Import existing KMZ files to view more information. Example: Soil KMZ file, Fish and Wildlife Service's Wetlands and Riparian KMZ file


Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image IBCAO
Google
Eye alt 9978.58 mi

KMZ Files
(Keyhole Markup Language Zip)

- Dylan Beaudette along with his staff at University of California – Davis have developed a KMZ file that links SSURGO and STATSGO data on the Soil Data Mart and NCSS Lab Data to Google Earth.
- The US Fish and Wildlife Service developed their NWI layer into a KMZ file that displays the location, type, size of wetlands habitats to a scale of 1:24,000.

Usage of Ratings (Top 20)



1126 acres (SSURGO) {VA179,md017}

GgB

Is

GwD

C1386W05

DfB

Is

Potobac-Issue complex, frequently flooded

Major Component List:

Potobac (70%)
Fluvaquentic Endoaquepts

Potobac-Issue complex, frequently flooded
flood plains
flood plains

Issue (25%)
Fluvaquentic Dystrudepts

Potobac-Issue complex, frequently flooded
flood plains
flood plains

Lenni (5%)
Typic Endoaquults

Potobac-Issue complex, frequently flooded
depressions
depressions

1345 f

©2010 Google

Imagery Date: Aug 29, 2010 38°29'20.48" N 76°55'56.22" W elev 35 ft Eye alt 4716 ft

California Soil Resource Lab

Map Unit Composition

Map units consist of 1 or more soil types, commonly referred to as "components".

Component Name	Geomorphic Position	Area Fraction	Component Type	Horizon Data
Soil Type 1 **Potobac**	flood plains flood plains	70%	Major Soil Type	YES
Soil Type 2 **Issue**	flood plains flood plains	25%	Major Soil Type	YES
Soil Type 3 **Lenni**	depressions depressions	5%	Inclusion	YES

*Note: links to horizon data marked with an * are approximate.*

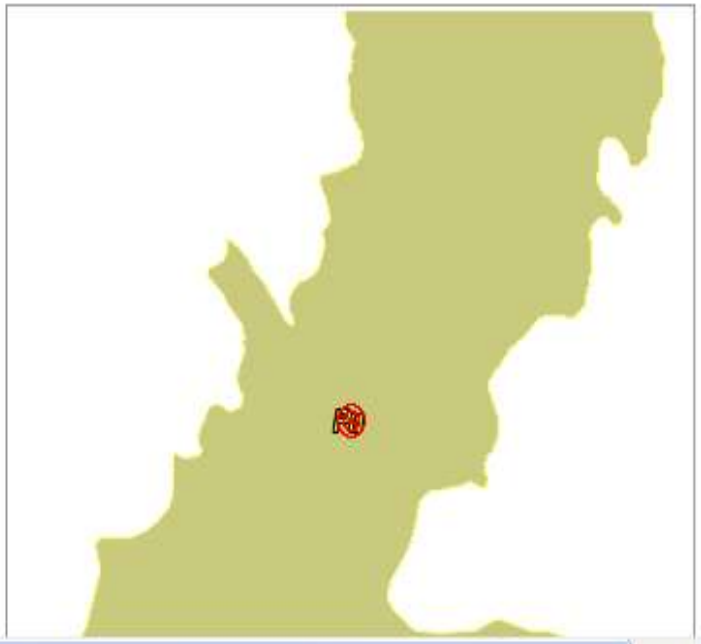
Map Unit Data *What is a Map Unit?*

Cartographic information about this map unit.

Map Unit Name:	Potobac-Issue complex, frequently flooded
Map Unit Type:	Complex
Map Unit Symbol:	Pu
Map Unit Acres:	9882 acres (27628ac. total in survey area)

Raw Map Unit Data

Raw Component Data (All Components)

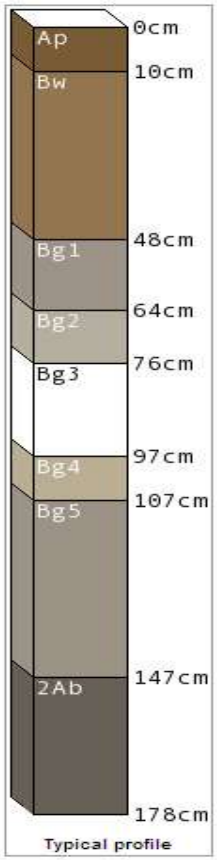


Map Unit Aggregated Data

Generalized soils information within this map unit.

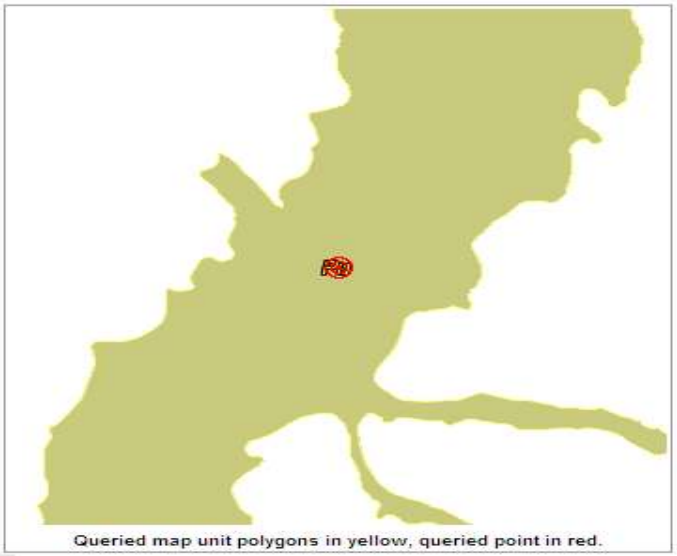
Farmland Class:	Not prime farmland
Available Water Storage (0-100cm):	15.62 cm
Max Flood Freq:	Frequent
Drainage Class (Dominant Condition):	Poorly drained
Drainage Class (Wettest Component):	Poorly drained
Hydric Conditions:	Partially hydric
[Annual] Min. Water Table Depth:	13 cm

California Soil Resource Lab



Typical profile

Soil Taxonomy


Queried map unit polygons in yellow, queried point in red.

Order:	*Inceptisols*
Suborder:	*Udepts* *[Map of Suborders]*
Greatgroup:	*Dystrudepts*
Subgroup:	*Fluvaquentic Dystrudepts*
Family:	*Coarse-loamy, mixed, active, mesic Fluvaquentic Dystrudepts*
Soil Series:	*Issue* *(Link to OSD)* *(Link to SM Tool)*
Data:	*[Lab Data]* *[Nitrate Groundwater Pollution Hazard Index]*
Raw Data	*Component* *All Horizons*

Land Classification

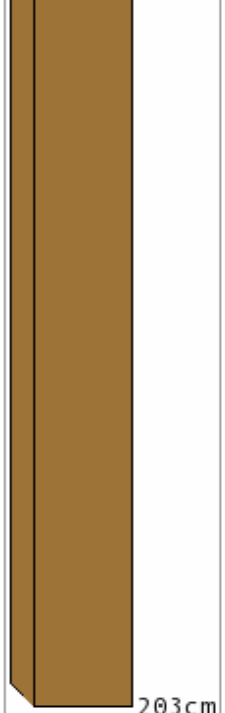
Storie Index	*NOT RATED*
Land Capability Class [non-irrigated]	*5-w*
Land Capability Class [irrigated]	-
Ecological Site Description	

Soil Suitability Ratings

Waste Related	*Engineering*
Urban/Recreational	*Irrigation*
Wildlife	*Runoff*

Hydraulic and Erosion Ratings

Wind Erodibility Group	*5*
Wind Erodibility Index	*56*
T Erosion Factor	*5*
Runoff	*Very high*
Drainage	*Somewhat poorly drained*
Hydric Rating / Hydrologic Group	*No [Group C]*
Parent Material:	*loamy alluvium*
Profile Water Storage (cm):	*31.02*



Typical profile

Soil Suitability Ratings

Waste Related	*Engineering*
Urban/Recreational	*Irrigation*
Wildlife	*Runoff*

Hydraulic and Erosion Ratings

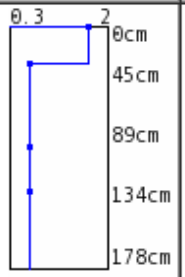
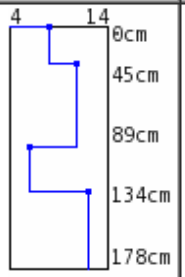
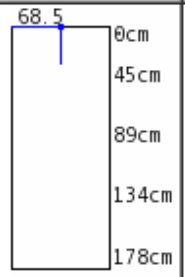
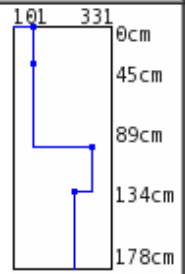
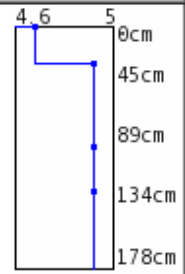
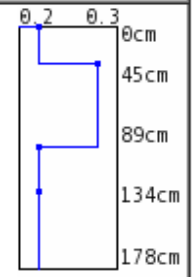
Wind Erodibility Group	*3*
Wind Erodibility Index	*86*
T Erosion Factor	*5*
Runoff	*Very low*
Drainage	*Well drained*
Hydric Rating / Hydrologic Group	*No [Group B]*
Parent Material:	
Profile Water Storage (cm):	*16.76*

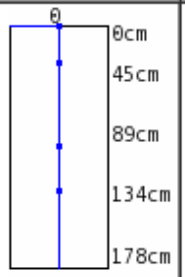
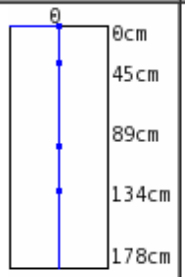
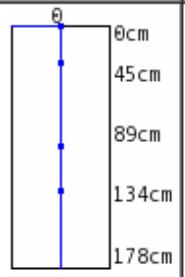
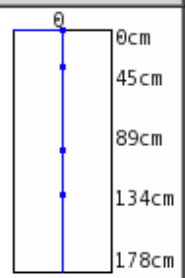
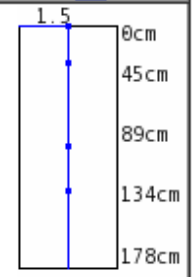
Geomorphology

Landform	*flats*
Landscape	*uplands*
Landscape	*uplands*
Landform	*flats*

Plants

Symbol	Scientific Name	Common Name	Range Prod.

Organic Matter (%)	Percent Clay	Percent Sand	K_{sat} (mm/hr)	pH (1:1 H_2O)	K_f Factor
					

EC (dS/m)	SAR	$CaCO_3$ (%)	Gypsum (%)	CEC at pH7 (cmol + /kg soil)	Linear Extensibility (%)
				no data	

LOCATION POTOBAC MD

Established Series
EHE-SLD-DRPV/Rev. JWB
06/2007

POTOBAC SERIES

MLRA(s): 149A (Northern Coastal Plain)
Depth Class: Very deep
Drainage Class (Agricultural): Poorly drained
Landscape: Coastal Plain
Parent Material: Sandy and loamy fluvial sediments
Slope: 0 to 2 percent
Mean Annual Air Temperature (type location): 13 degrees C. (56 degrees F.)
Mean Annual Precipitation (type location): 1067 mm (42 inches)

TAXONOMIC CLASS: Coarse-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts

TYPICAL PEDON: Potobac loam on a wooded floodplain. (Colors are for moist soil unless otherwise indicated.)

A1--0 to 10 cm (0 to 4 inches); dark brown (10YR 3/3) loam; weak coarse subangular blocky structure parting to moderate fine subangular blocky; nonsticky, slightly plastic; few fine prominent yellowish red (5YR 4/6) soft masses of iron accumulation along root channels; strongly acid; clear wavy boundary.

A2--10 to 20 cm (4 to 8 inches); 60 percent grayish brown (2.5Y 5/2) and 40 percent dark yellowish brown (10YR 3/4) loam; weak, coarse and medium subangular blocky structure; less than 1 percent subrounded mixed gravel; strongly acid; clear wavy boundary. (Combined thickness of the A horizons is 3 to 25 cm)

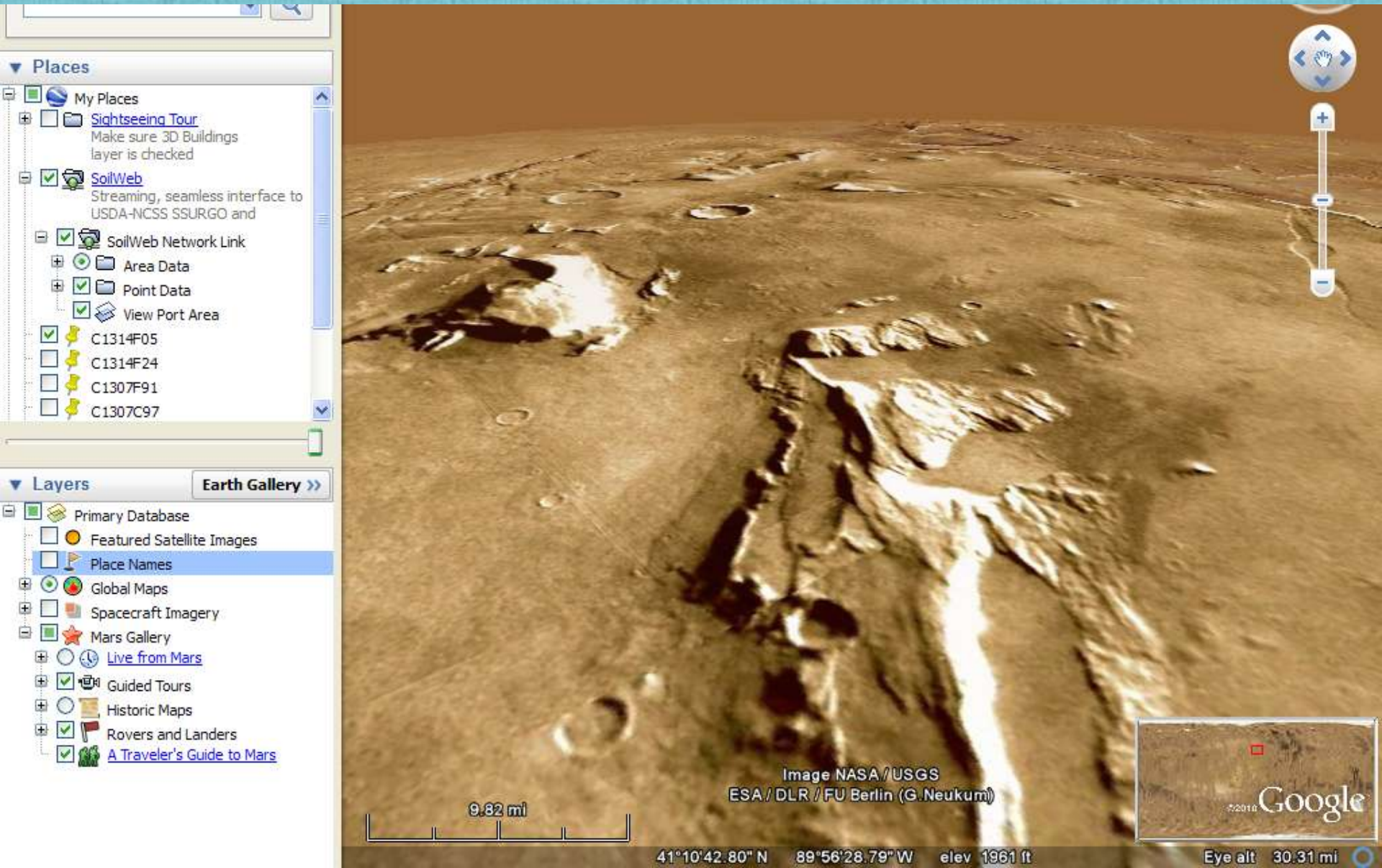
Bg1--20 to 33 cm (8 to 13 inches); olive gray (5Y 5/2) loam; weak coarse subangular blocky structure; nonsticky, slightly plastic; many medium prominent red (2.5YR 5/8) soft masses of iron accumulation; less than 1 percent subrounded mixed gravel; strongly acid; gradual wavy boundary.

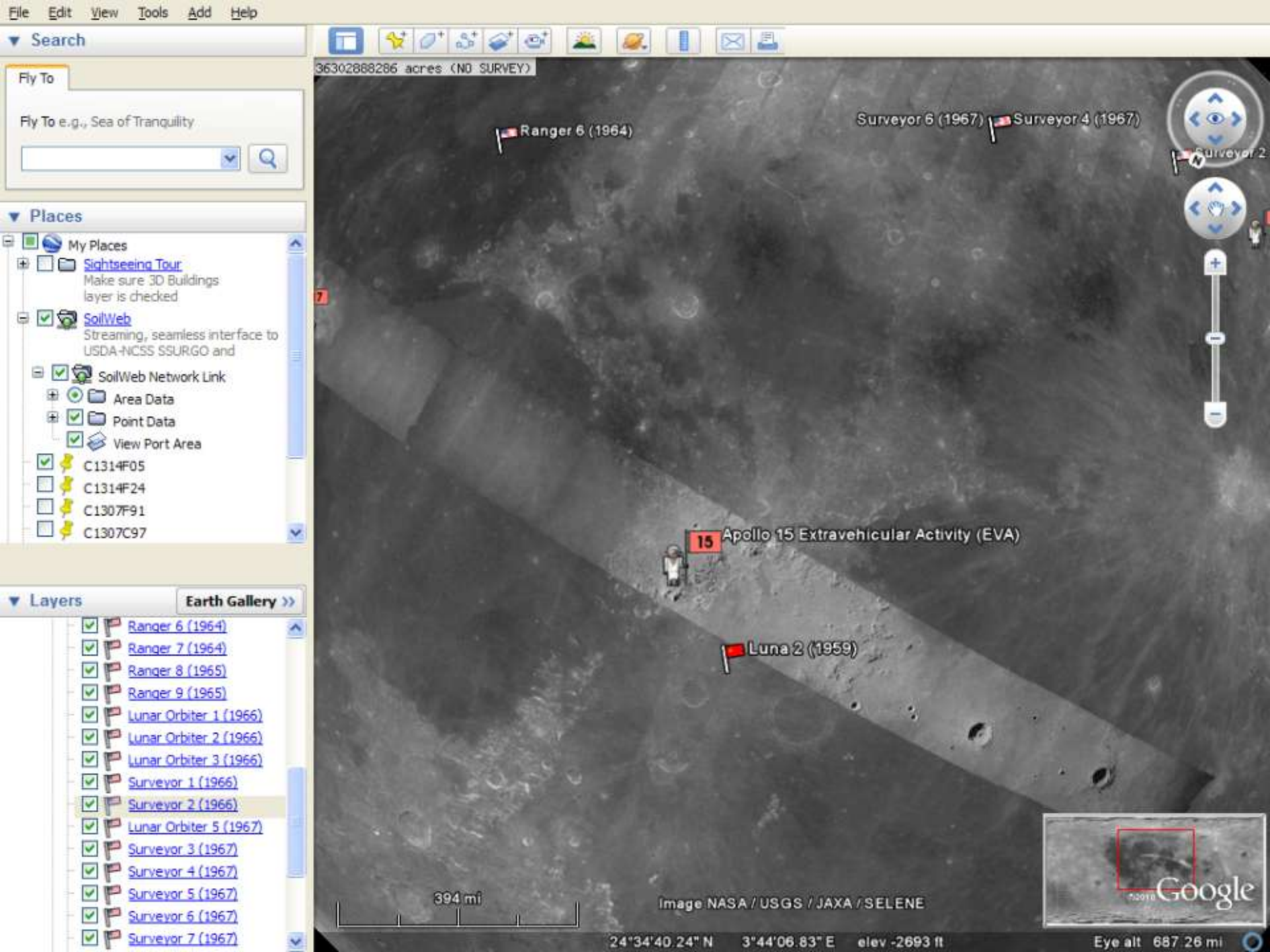
Bg2--33 to 43 cm (13 to 17 inches); olive gray (5Y 5/2) loam; weak coarse subangular blocky structure; nonsticky, slightly plastic; common coarse prominent reddish brown (5YR 4/4) soft masses of iron accumulation; neutral; abrupt wavy boundary. (Combined thickness of the Bg horizon is 15 to 81 cm)

Cg1--43 to 102 cm (17 to 40 inches); dark grayish brown (2.5Y 4/2) sandy loam; massive; nonsticky, slightly plastic; 5 percent, by volume, subrounded mixed gravel; neutral; gradual wavy boundary.

Cg2--102 to 152 cm (40 to 60 inches); grayish brown (2.5Y 5/2) very gravelly sand; single grain; nonsticky, nonplastic; 45 percent, by volume, subrounded mixed gravel; neutral

Bored with Google Earth?
How about Google Mars!

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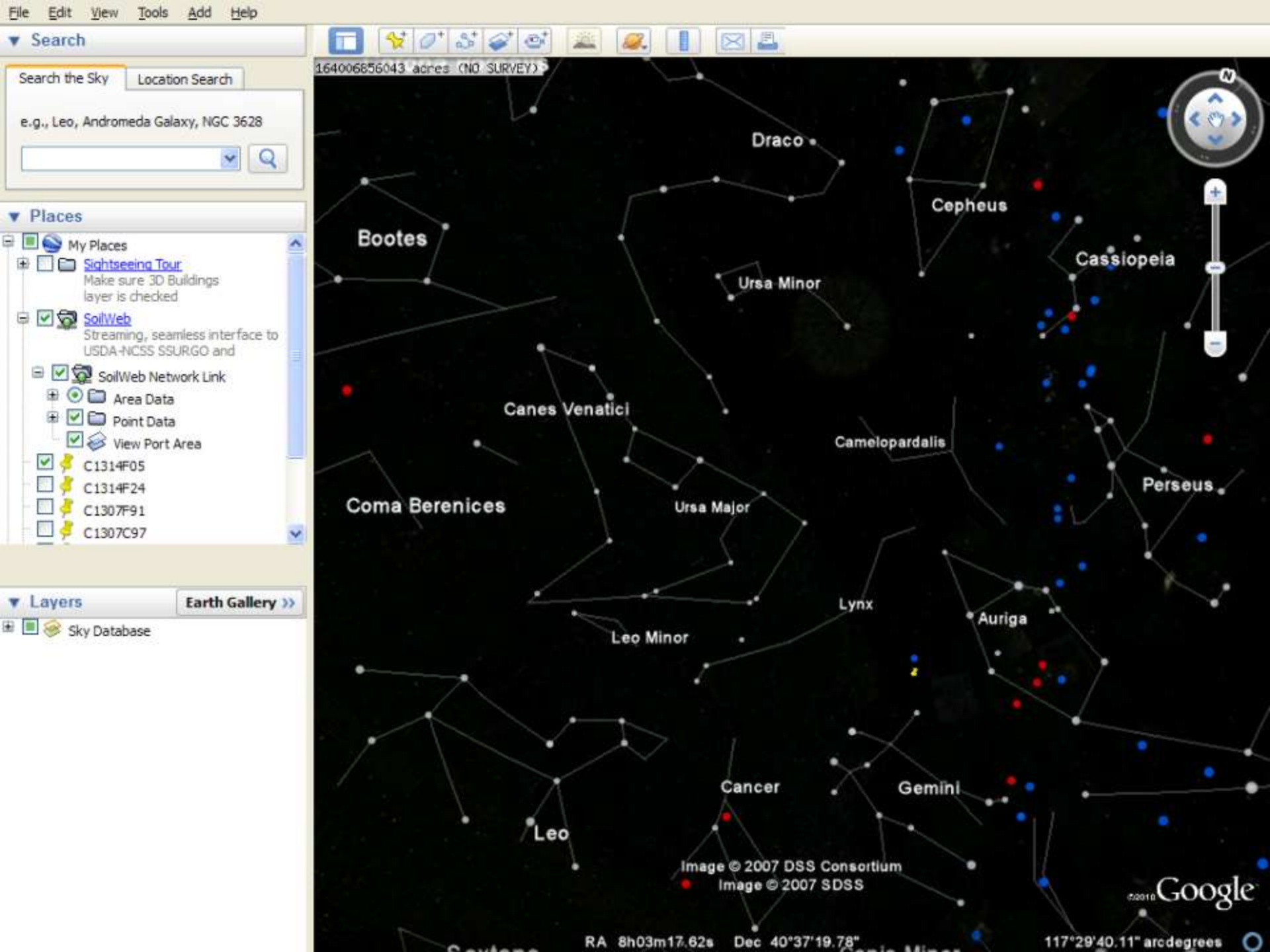
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
SoilWeb
Streaming, seamless interface to USDA-NCSS SSURGO and
SoilWeb Network Link
Area Data
Point Data
View Port Area
C1314F05
C1314F24
C1307F91
C1307C97
Layers
Earth Gallery
Ranger 6 (1964)
Ranger 7 (1964)
Ranger 8 (1965)
Ranger 9 (1965)
Lunar Orbiter 1 (1966)
Lunar Orbiter 2 (1966)
Lunar Orbiter 3 (1966)
Surveyor 1 (1966)
Surveyor 2 (1966)
Lunar Orbiter 5 (1967)
Surveyor 3 (1967)
Surveyor 4 (1967)
Surveyor 5 (1967)
Surveyor 6 (1967)
Surveyor 7 (1967)
36302888286 acres (NO SURVEY)
Ranger 6 (1964)
Surveyor 6 (1967)
Surveyor 4 (1967)
Surveyor 2
15
Apollo 15 Extravehicular Activity (EVA)
Luna 2 (1959)
394 mi
Image NASA / USGS / JAXA / SELENE
Google
24°34'40.24" N 3°44'06.83" E elev -2693 ft
Eye alt 687.26 mi


File
Edit
View
Tools
Add
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Search
Search the Sky
Location Search
e.g., Leo, Andromeda Galaxy, NGC 3628
Places
My Places
Sightseeing Tour
Make sure 3D Buildings layer is checked
SoilWeb
Streaming, seamless interface to USDA-NCSS SSURGO and
SoilWeb Network Link
Area Data
Point Data
View Port Area
C1314F05
C1314F24
C1307F91
C1307C97
Layers
Earth Gallery
Sky Database
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Draco
Cepheus
Bootes
Cassiopeia
Ursa Minor
Canes Venatici
Camelopardalis
Perseus
Coma Berenices
Ursa Major
Lynx
Auriga
Leo Minor
Cancer
Gemini
Leo
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©2010 Google
RA 8h03m17.62s Dec 40°37'19.78"
117°29'40.11" arcdegrees

Credits

- http://casoilresource.lawr.ucdavis.edu/drupal/
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- http://soildatamart.nrcs.usda.gov/
- http://www.fws.gov/wetlands/Data/GoogleEarth.html