United States Department of Agriculture
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Uses of Soil Moisture Data in Soil Survey

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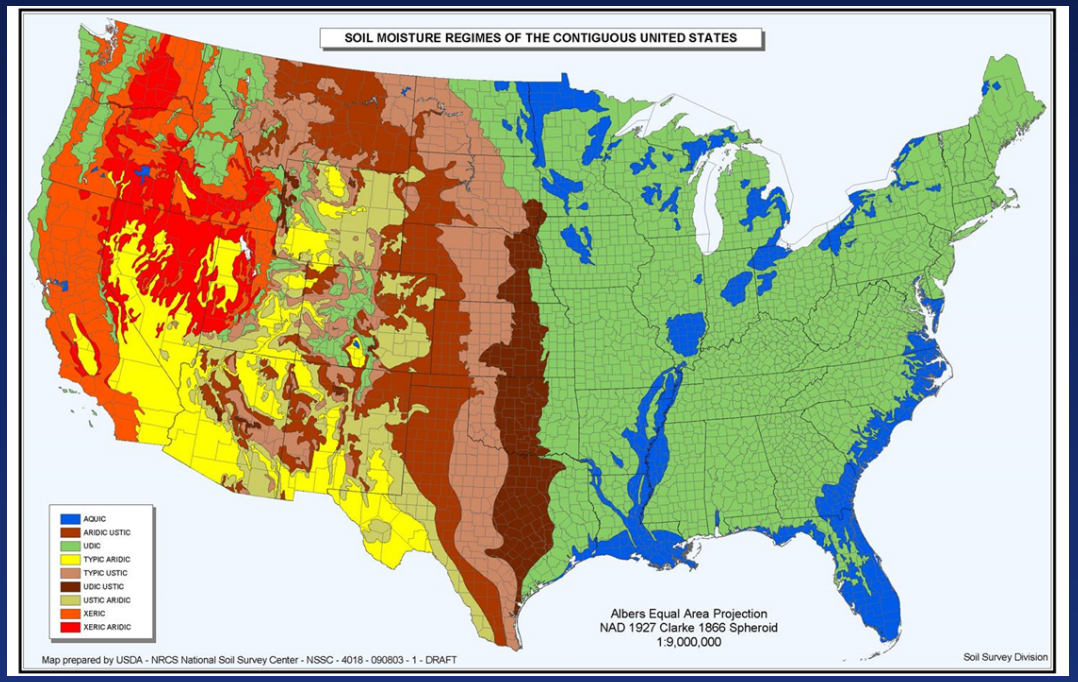
Soil moisture data is used in the Classification of soils (Soil Taxonomy)

- Soil moisture is one of many properties used to classify soils.
- Example – Mollisols

  Some part of the epipedon **is moist for 90 days or more (cumulative) in normal years** during times when the soil temperature….

- Soil Taxonomy - Soil climate is described by soil moisture and temperature regimes.

- Soil Moisture Regimes
  - Defined based on water table level and presence of available water
  - Measured directly or
  - Estimated using precipitation data
- SCAN data has been used to define boundaries



Soil moisture is inventoried in Soil Survey

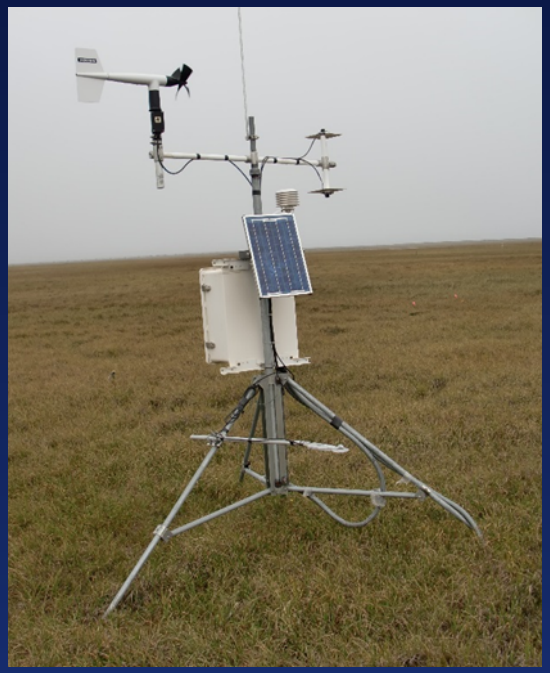
- Soil moisture information is collected and stored in Soil Survey Database (NASIS).
- For each Mapunit Component
  - Mean monthly soil water state at a specified depth is recorded
    - Dry – > 1500 kPa
    - Moist – 1500 to 0.01 kPa
    - Wet – < 0.1 kPa (free water present)

Component Soil Moisture | Component Soil Temperature

		Top Depth			Bottom Depth			
	Seq	Low	RV	High	Low	RV	High	Moisture Status
M		0	0	0	91	122	152	moist
▶ E		91	122	152	183	183	183	wet
*								

Soil climate monitoring Data

- Collected during the course of a Soil Survey or update.
- Can be stored in NASIS (Soil Survey Database)
  - Daily mean, max, and min soil moisture content at a specified depth.



Soil Monitor Data

		User Site ID	Site Rec ID	Observation Date	Observation Date Kind	Site Observati...	User Pedon ID
					Lineage		
E		jim's test - 15	13	05/23/1998	actual site observation date	10	jim's test1 - dry

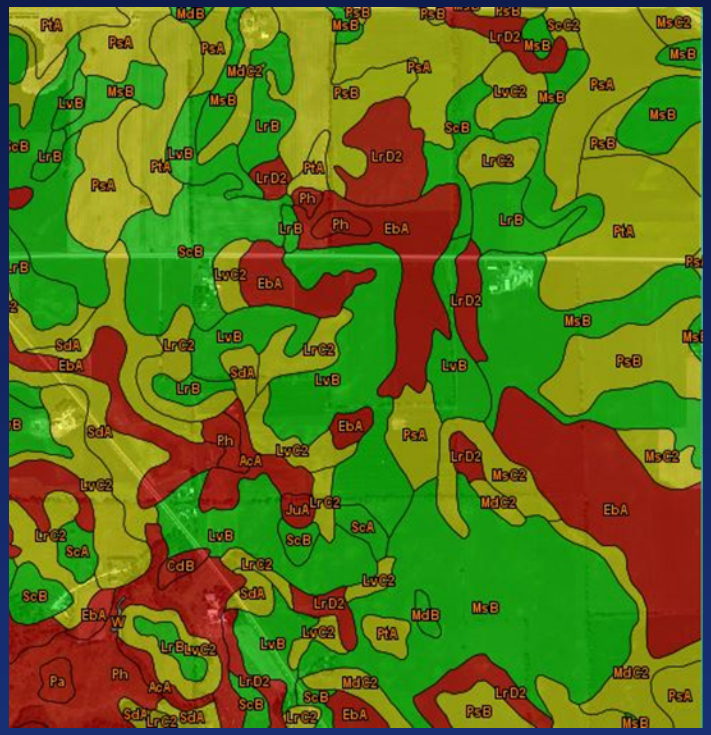
Soil Moisture Monitor Data | Soil Temperature Monitor Data

	Sensor ID	Sensor Depth	Sensor Kind	Min Soil Moisture - Vol	Ave Soil Moisture - Vol	Max Soil Moisture - Max
N	241	50.0	hydra probe II SDI-12	12.00	13.00	14.00

Soil Survey Interpretations

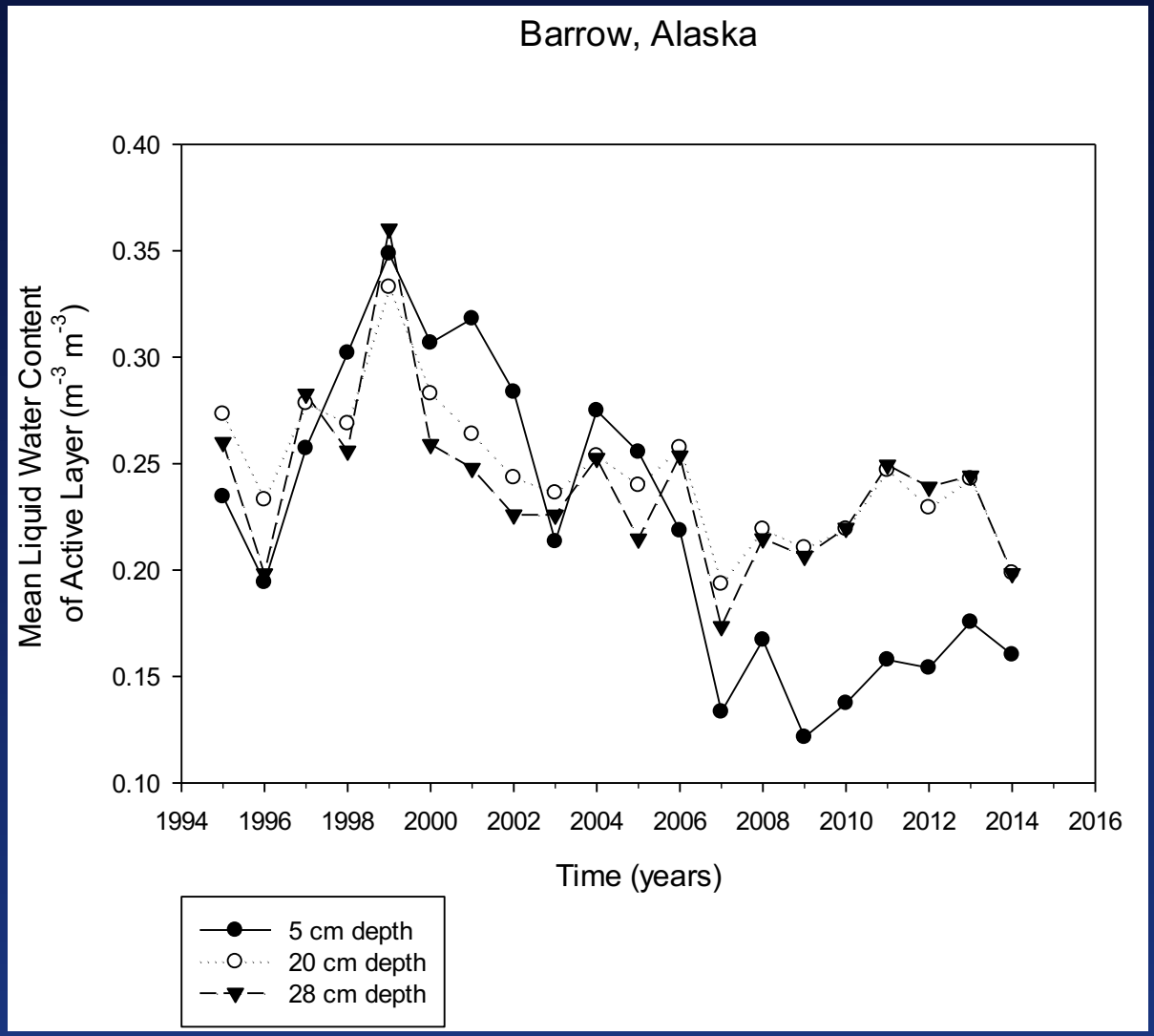
- Provide predictions of soil behavior for specified uses
- Interpretations are generated from soil survey data (NASIS database).
  - Soil moisture status (by month)
  - Soil Moisture Regime
  - Drainage class

Dwellings with Basements



Research - Soil Climate Monitoring (Arctic Alaska)

- Monitoring soil moisture and temperature.
  - Determine the effects of climate change on the active layer and upper permafrost.
    - Effects carbon storage
  - Data is available online
  - Soil moisture data is used by other researchers
    - Carbon fluxes
    - Tundra vegetation studies


Barrow, Alaska
Mean Liquid Water Content of Active Layer (m-3 m-3)
0.40
0.35
0.30
0.25
0.20
0.15
0.10
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
Time (years)
5 cm depth
20 cm depth
28 cm depth

Soil Moisture data is used in Soil Health/DSP studies

- Measuring a minimum data set of soil properties to evaluate the soil's ability to perform basic functions.
- Properties vary with soil moisture
  - Infiltration/ water movement
  - Bulk density
  - Biological properties