A Soil Profile In South-Central Wyoming

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Soils 5120

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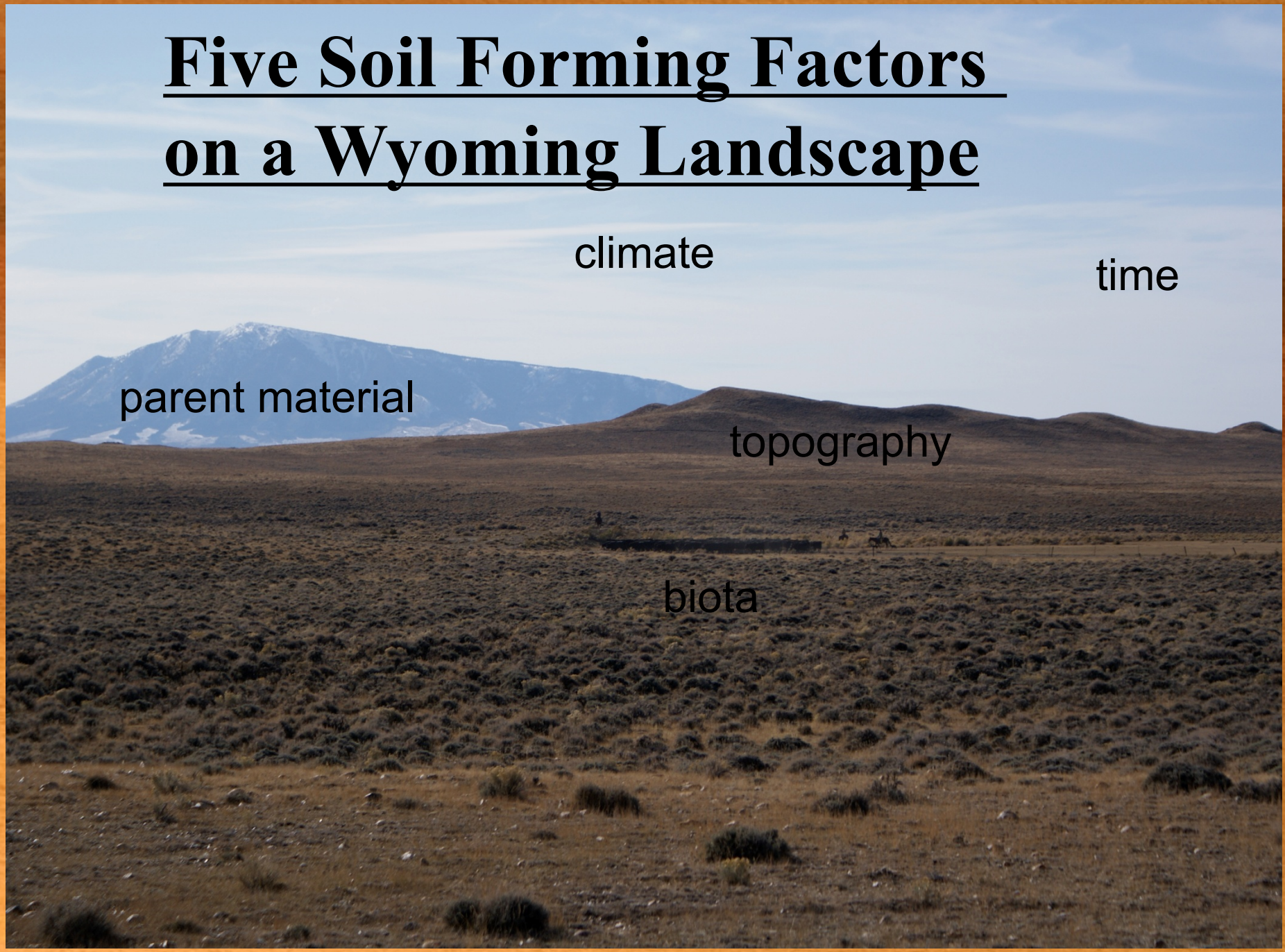
Five Soil Forming Factors on a Wyoming Landscape



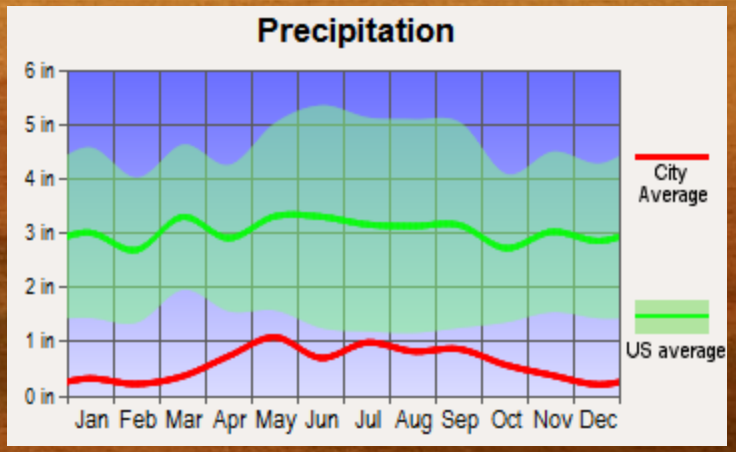
Climate Patterns Throughout Time in South-Central Wyoming

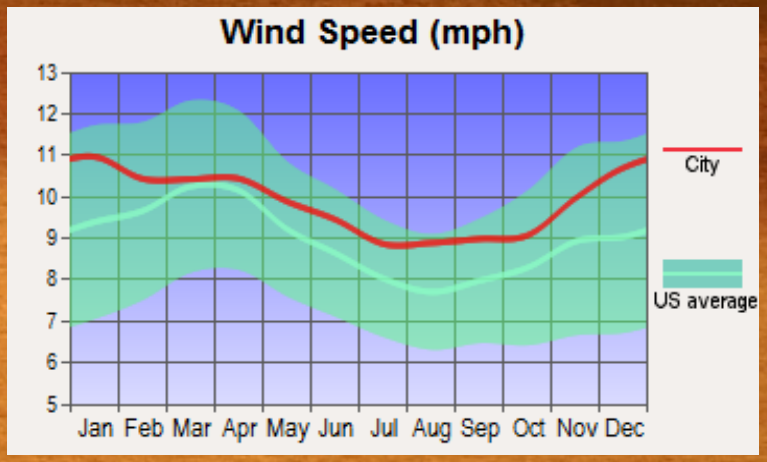
- **South-central Wyoming receives an average of 7-12 inches of precipitation per year, making it an arid environment (NRCS, 2009).**

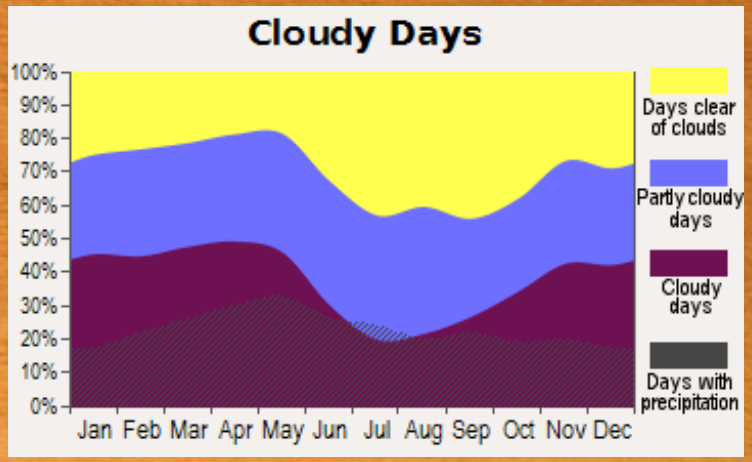
- **This area has above average wind speeds compared to the rest of the nation.**

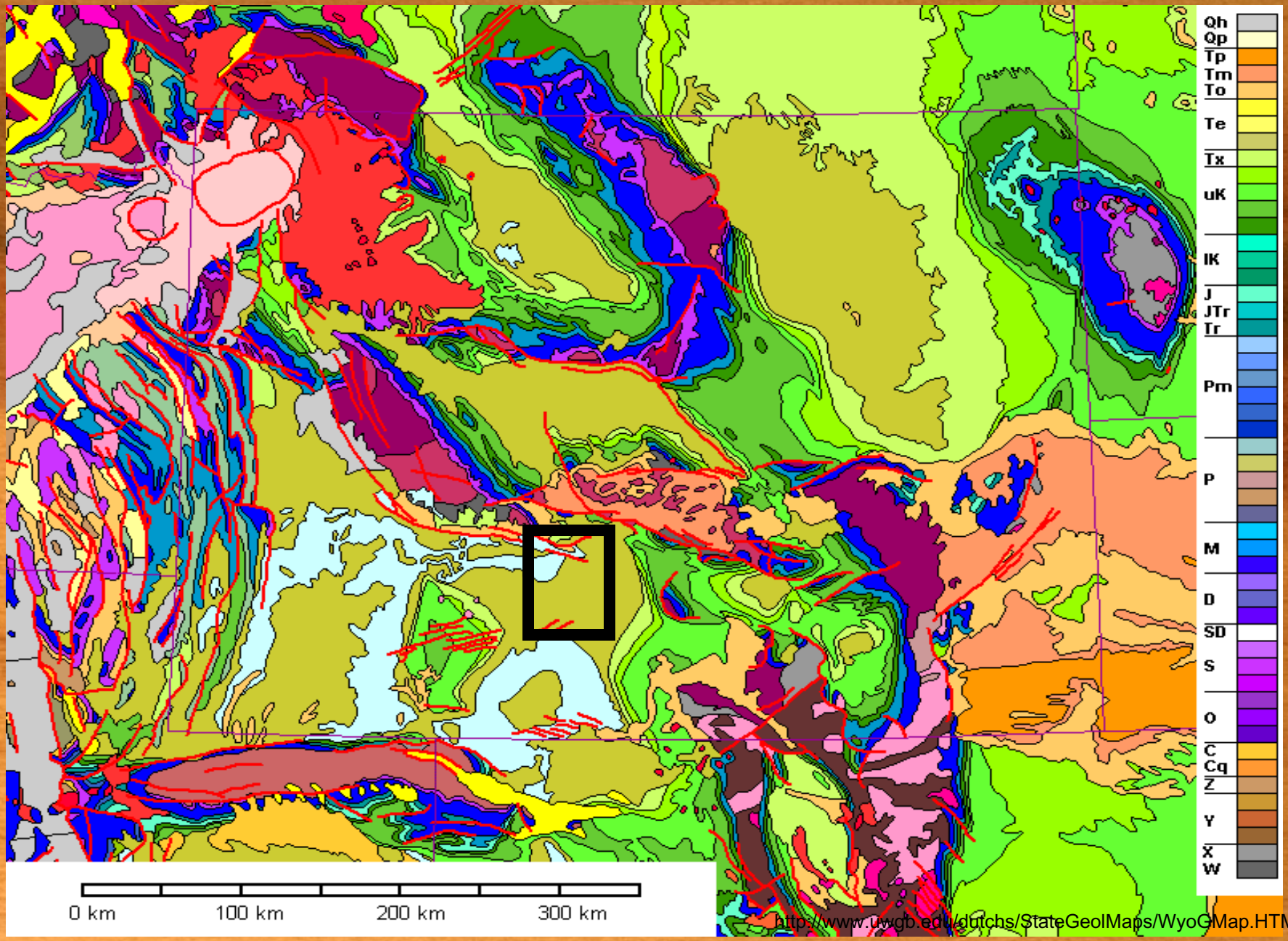
- **This area has a relatively equal number of cloudy, sunny, and wet days during the year.**

(City-Data.com, 2009)









Geologic map of area where soil pit was dug. This map shows the area of interest to be a "large sedimentary basin" (About.com, 2009). Soils here likely formed in place, with large amounts of soil distributed by wind deposition.

Parent material of the site likely consisted of 2:1 clays and limestone.

Local topography consists of minor relief. Alluvial fans are present, and contribute to drainage and sunlight effecting lowland soils.

Surface and underground biota include species typically found in sage-steppe environments. Plants organisms must be able to tolerate aridic moisture regime. This area also has a history of cattle and sheep grazing.

-typical landscape for the area

-high elevation stage-steppe desert
(pit dug at 2097 meters = 6879 feet)

-natural gas well-pad near pit site

Surrounding Vegetation:
Sagebrush, Gardner saltbrush, Indian rice-grass, Thickspike, Winterfat, Rabbitbrush

Some weeds present near site:
Halogeton, Cheat-grass, Russian thistle

Soil pit dug here in undisturbed sage lowland

Mmmm….
Soil!

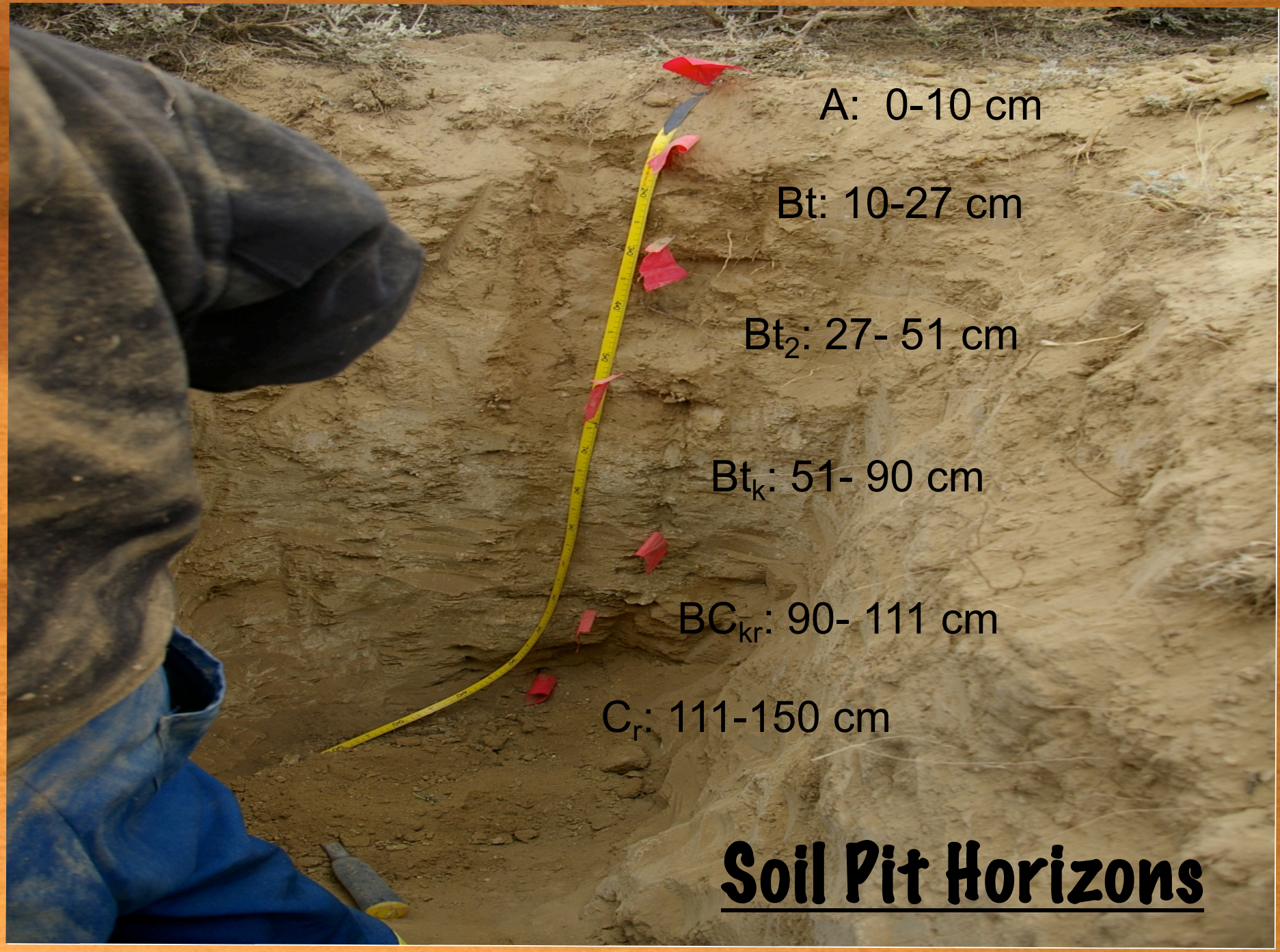
What kind??

……Calcid !!!

- Six horizons were identified

- Soils were textured/ described in the field

- Further analysis conducted at UW lab



Soil Pit Horizons

Horizon Textures, Structures, etc.

A Ochric	fine sandy loam; slightly hydrophobic; medium-moderate sub-angular blocky; granular structure; many fine roots
B_t Argillic	loam; sub-angular blocky; few hard nodules of $CaCO_3$; many fine roots
B_{t2} Argillic	silt loam; medium to moderate sub-angular blocky; common fine and medium roots
B_k Calcic	loam; fine to medium subangular blocky; filaments, nodules, and coatings of $CaCO_3$; fine roots
BC_{kr} Petro-calcic	clay loam; weak- medium $CaCO_3$ nodules; decomposed gravel/silt stone; medium fine roots
C_{kr} Petro-calcic	strange pocket of clay...maybe a rodent hole; rest of layer sandy loam; some decomposed gravel/silt stone; some massive without structure; some $CaCO_3$ still present

Soil Horizon Characteristics: Back at the Lab

Horizon	Electrical Conductivity	pH	Effervesence by 10% HCl Application	Wet Color	Dry Color
A Ochric	365 uS	7.82	very slight	7.5 YR 4-3	10 YR 5-4
B_t Argillic	262 uS	9.40	slight	7.5 YR 4-3	10 YR 6-4
B_{t2} Argillic	478 uS	8.63	strong	7.5 YR 4-3	10 YR 6-4
B_k Calcic	7.21 mS	8.28	violent	7.5 YR 4-4	10 YR 7-4
BC_{kr} Petro-calcic	11.13 mS	8.97	violent	10 YR 6-3	10 YR 7-3
C_{kr} Petro-calcic	4.22 mS	8.65	violent	10YR 6-3	10 YR 7-3

Discussion:

This soil is a pretty typical Wyoming Aridisol. It has structured clay formations, and high $CaCO_3$ content. These exist because of the arid conditions, which prevent high amounts of leaching throughout the profile.

Because of limitations to plant growth and water availability, grazing levels of this landscape should be low to moderate.

These are also factors to be considered when determining appropriate levels for other disturbances, such as drilling practices, which are currently active in the area. Because revegetation of these disturbed sites is also limited by water and the types of native plant communities, caution should be taken in altering these landscapes

References:

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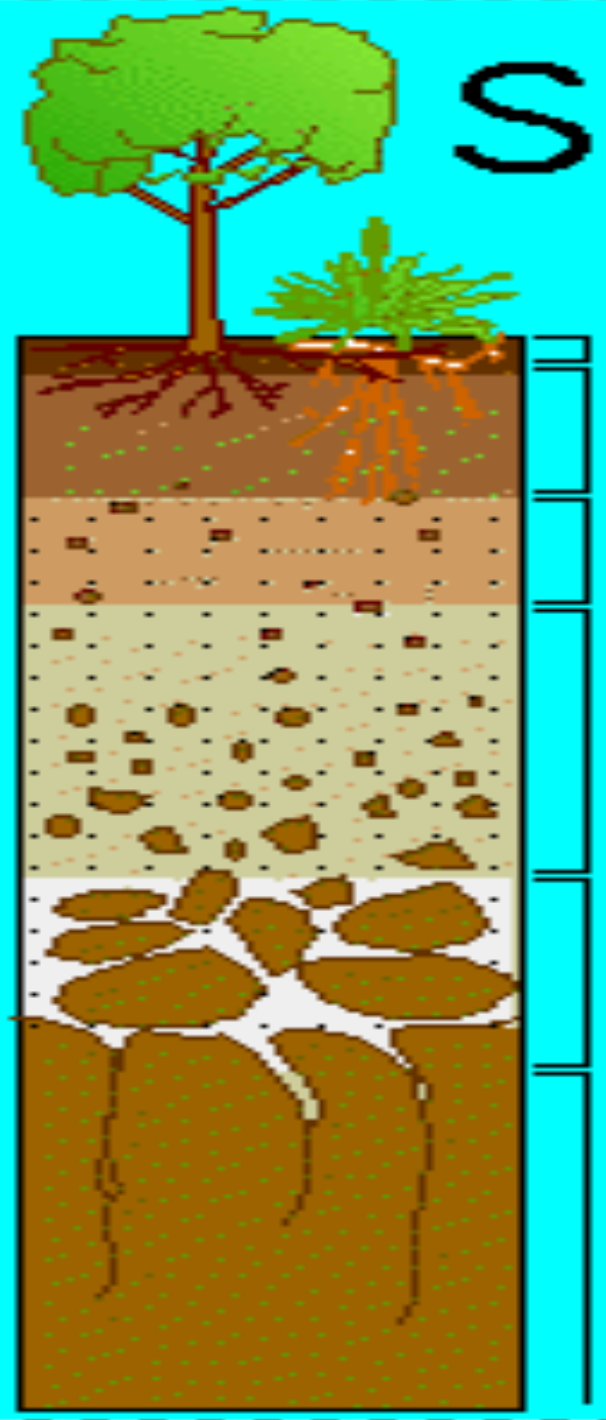
Soil Layers



O Horizon (humus)

A Horizon (topsoil)

E Horizon (eluviation layer)

B Horizon (subsoil)

C Horizon (regolith)

R Horizon (bedrock)