SOIL MOISTURE ANALYSIS USING SMOS SATELLITE DATA
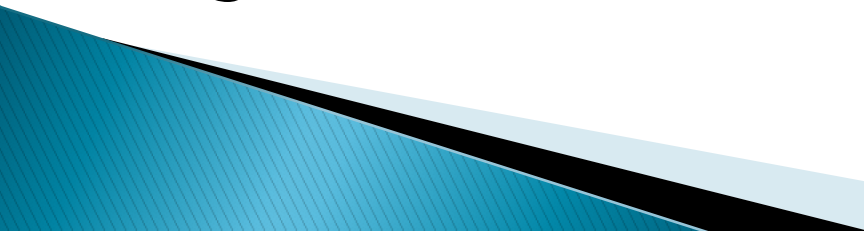
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Definition

SOIL

Soil is a natural body that consists of layers (soil horizons), composed primarily of minerals , which differ from their parent materials in their texture, structure, consistency, color, chemical, biological and other physical characteristics. Soil is the end product of the influence of the climate (temperature, precipitation), relief (slope), organisms (flora and fauna), parent materials (original minerals), temperature, and time.

SOIL MOISTURE

Soil moisture is the water that is held in the spaces between soil particles. Surface soil moisture is the water that is in the upper 10cm of soil, whereas root zone soil moisture is the water that is available to plants, which is generally considered to be in the upper 200 cm of soil. Soil Moisture Estimation Direct method: Measurement of moisture content in the soil (wetness) Indirect methods: Measurement of water potential or stress or tension under which water is held by the soil.

METHODS

▸ DIRECT METHODS

Gravimetric Methods: Soil sample from the desired depths are collected with a soil auger in air tight aluminum containers. The soil samples are weighed and they are dried in an oven at 105 degree C for about 24 hours until all the moisture is driven off. After removing from oven, they are cooled slowly to room temperature and weighed again. the difference in weight is amount of moisture in the soil. The moisture content in the soil is calculated by the following formula:

Moisture content   Wet weight Dry weight   on weight basis   =   --------------------------------

X 100

Dry weight

Gravimetric Techniques · Oven drying a soil sample at 1050C for about 12 hours.

Volumetric Method: Soil sample is taken with a core sampler or with a tube auger whose volume is known. The amount of water present in soil sample is estimated by drying it in the oven and calculating by following formula:

Moisture content = Moisture content (%) by weight x Bulk Density (%) by volume Volumetric Soil Moisture (gm/cm3)

DATA

- The Data used was obtained from SMOS Satellite , it was first analyzed with matlab , and later python.
- This is the first time we are using satellite data for this purpose, it was quite a herculean task however we were able to get some graphs which are shown in the next slides.

Figure 1
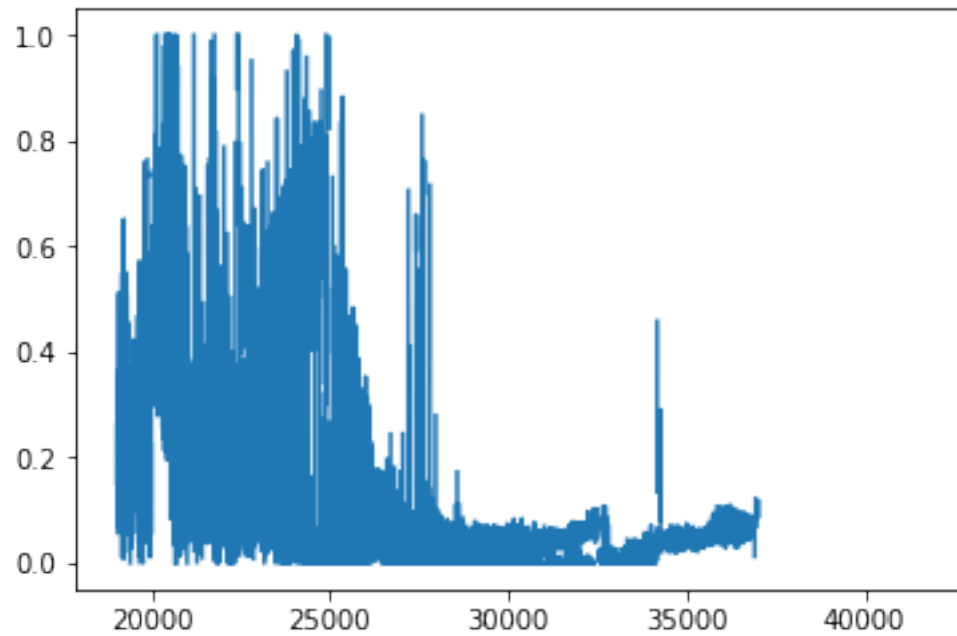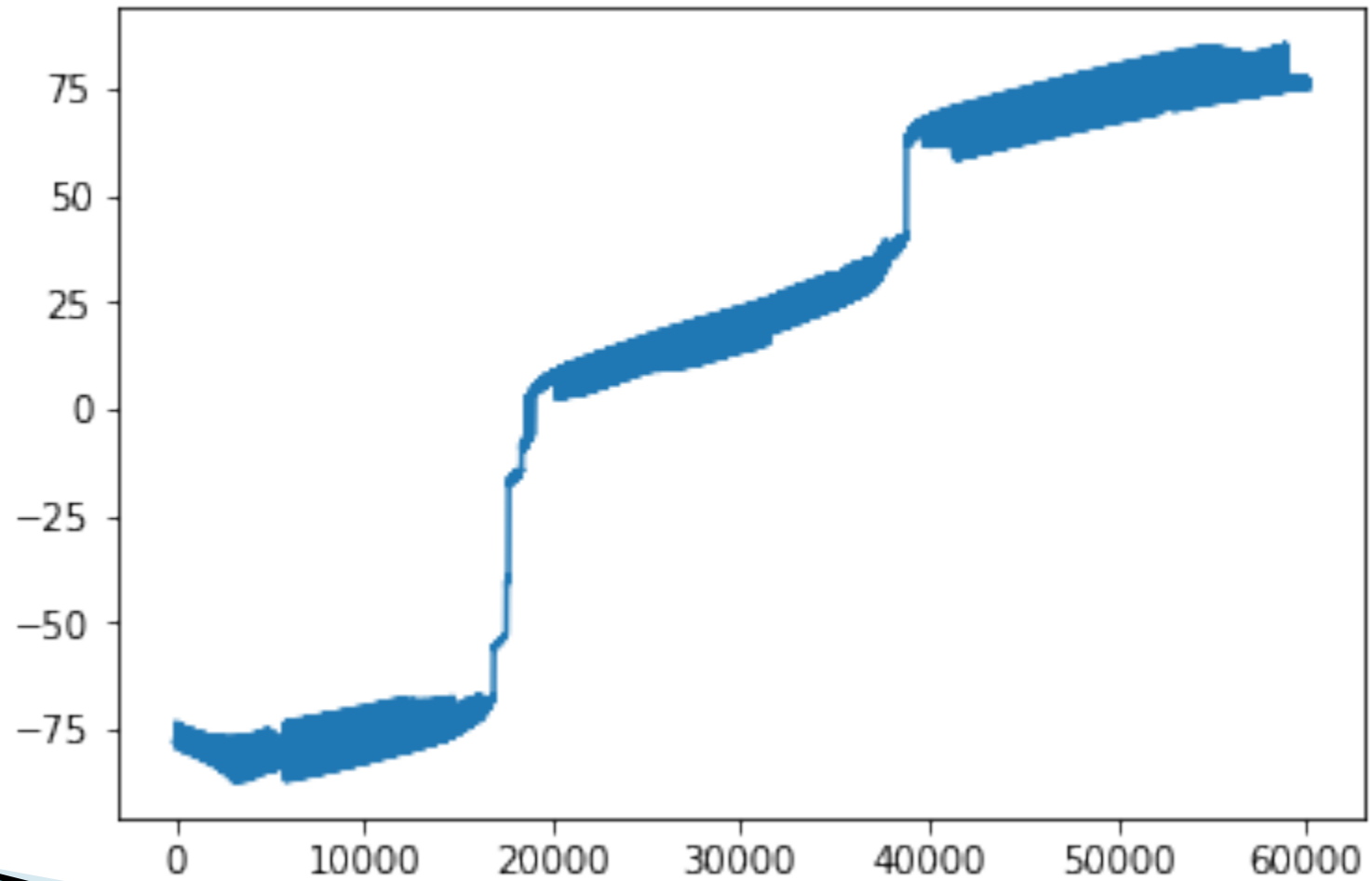## longitude, latitude and soil moiture
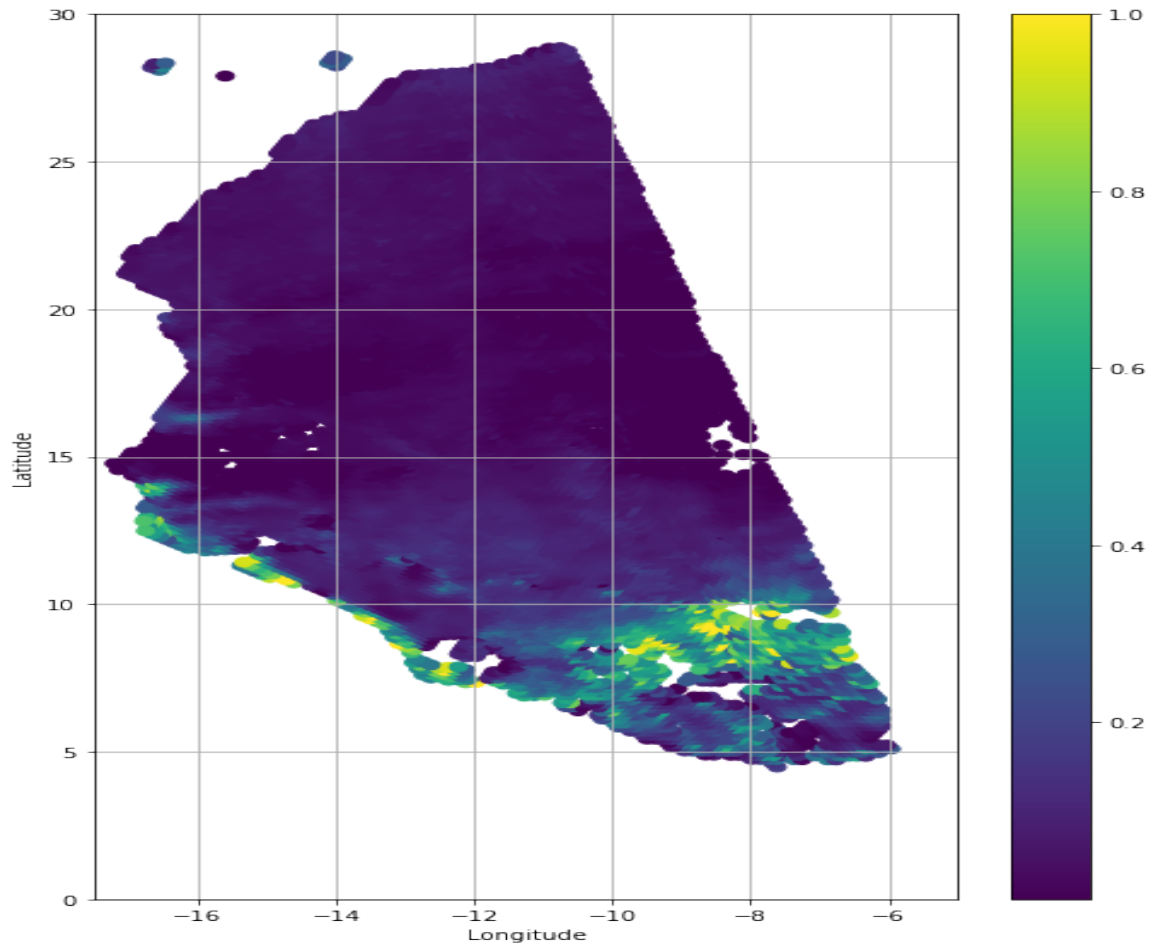
Soil Moisture 2(Fig 2)

Fig 3
Longitude

CONCLUSION

▸ From the Figure, it is evident that Soil moisture decreases from the coast to the inland

THANK YOU