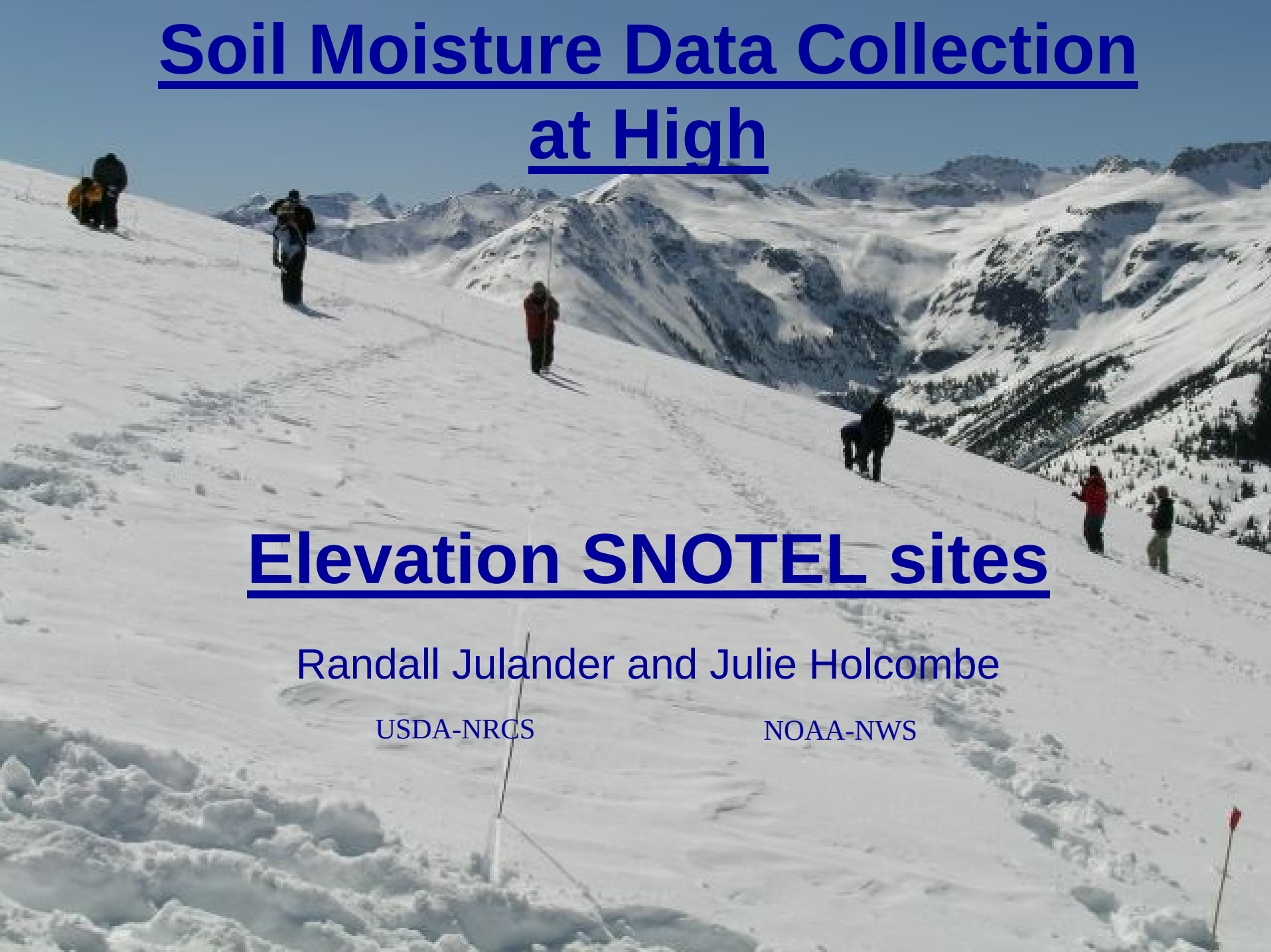
Soil Moisture Data Collection at High Elevation SNOTEL sites



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INTRODUCTION

- Snow water equivalent and streamflow shows strong relationship.
- Antecedent soil moisture influences seasonal water supplies from the snowpack.
- Soil moisture indices successful in agricultural settings…
- Soil moisture and climate feedback.

INTRODUCTION

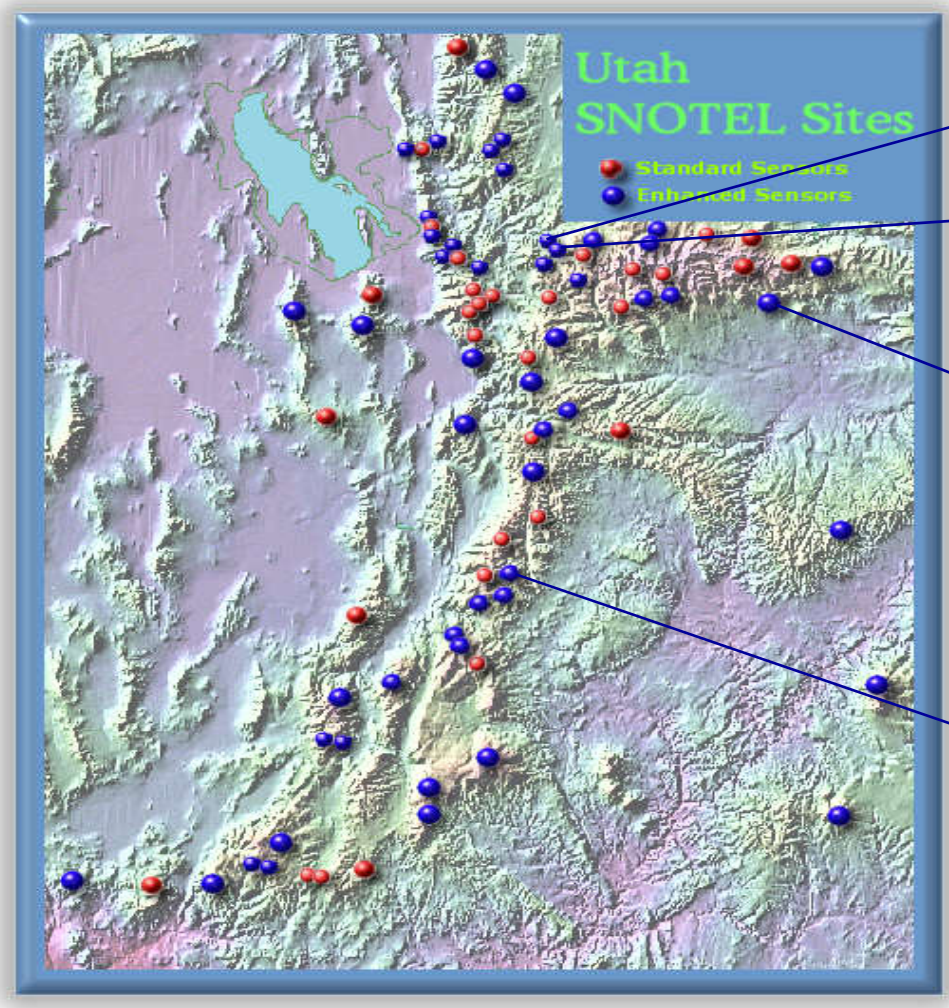
- SNOTEL.
- Represent subsurface watershed processes?
- Predominant soil type?
- Soil properties, soil and site characteristics.
- Quantify soil moisture = reduction forecast error.

OBJECTIVE

- **Objective**: To link anomalous soil moisture data to site and soil characteristics.

- **Purpose**: To improve water supply forecasting using a soil moisture index.

STUDY SITES



Chalk Creek II

Chalk Creek I

Mosby Mountain

Buck Flat

STUDY SITES

Chalk Creek I
- 2775 m
- Clay
- Timing snowmelt

Chalk Creek II
- 2500 m
- Sandy-Coarse
- Timing snowmelt

STUDY SITES

Mosby Mountain

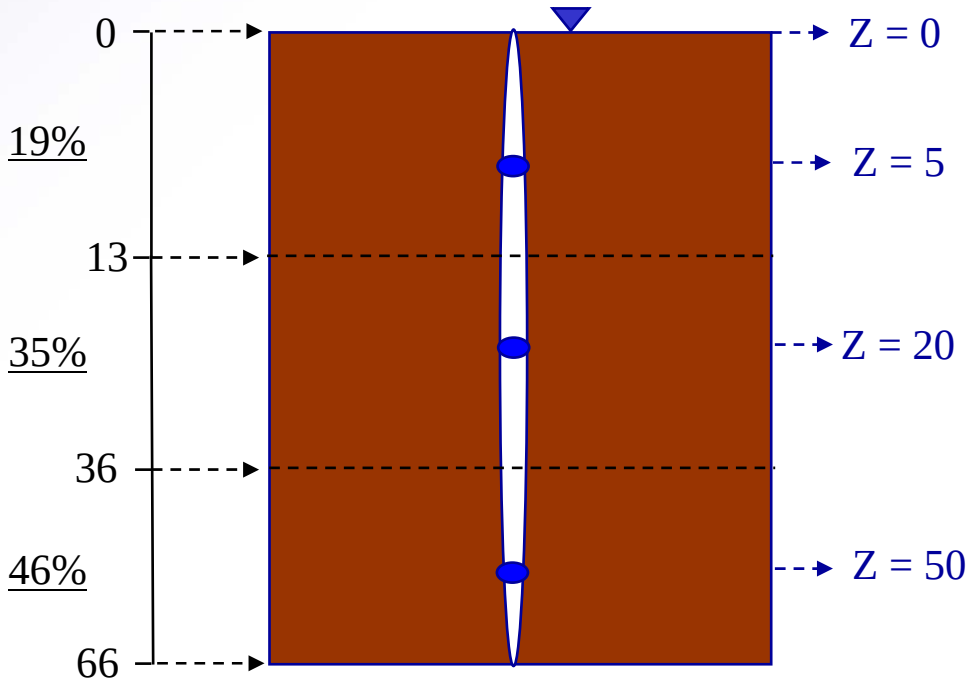
- 2900 m
- S face Uintah
- Sandy-Coarse
- Meltwater convergence

Buck Flat

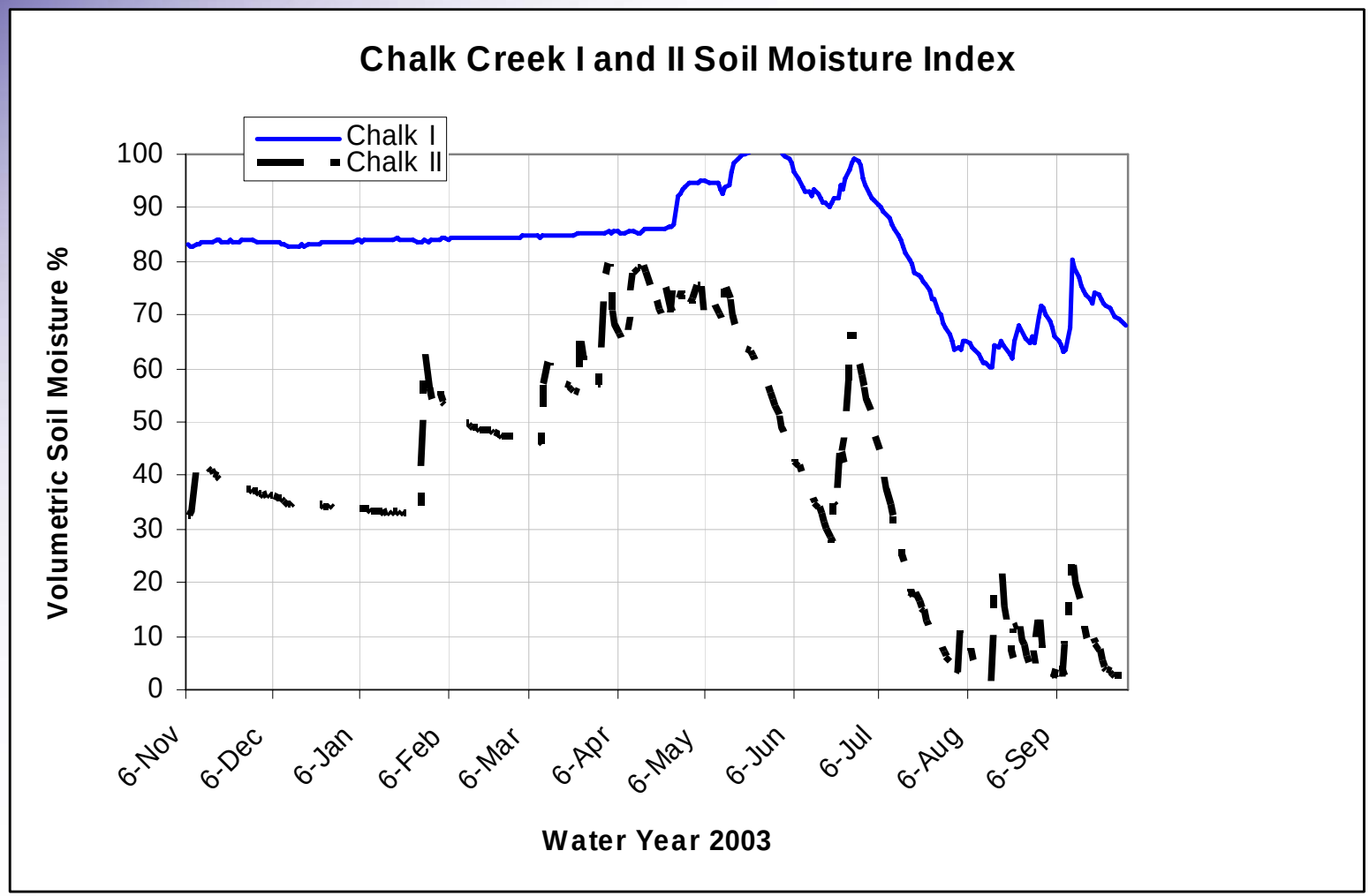
- 2987 m
- Wasatch Plateau
- Clay-Fine
- Flat, vertical soil moisture

METHODS

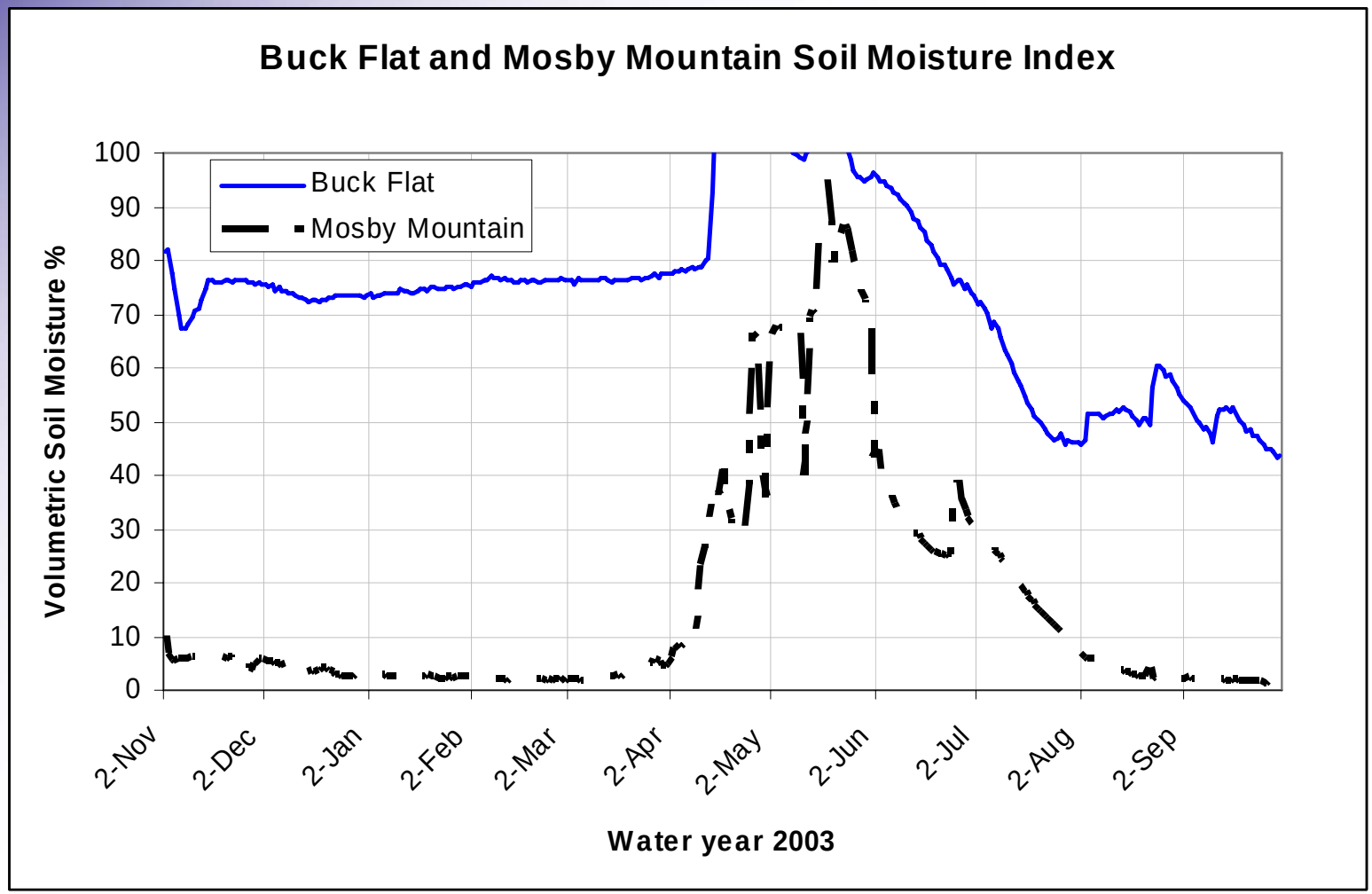
- Soil Characterization.
- 5, 20, 50 cm below the soil surface.
- Weighting:



RESULTS


Chalk Creek I and II Soil Moisture Index
Chalk I
Chalk II
Volumetric Soil Moisture %
100
90
80
70
60
50
40
30
20
10
0
6-Nov
6-Dec
6-Jan
6-Feb
6-Mar
6-Apr
6-May
6-Jun
6-Jul
6-Aug
6-Sep
Water Year 2003

RESULTS


Buck Flat and Mosby Mountain Soil Moisture Index
Volumetric Soil Moisture %
100
90
80
70
60
50
40
30
20
10
0
Buck Flat
Mosby Mountain
2-Nov
2-Dec
2-Jan
2-Feb
2-Mar
2-Apr
2-May
2-Jun
2-Jul
2-Aug
2-Sep
Water year 2003

RESULTS

- Mosby Mountain & Buck Flat: Little year to year variability at Mosby Mountain, but high variability at Buck Flat.
- Chalk Creek I & II: Amplitude and Magnitude differences in soil moisture data due to soil characteristics. Timing due to elevation.

CONCLUSIONS

- Trial & Error.
- Buck Flat & Chalk Creek I index reflect climatic abnormalities.
- Index not good for sites such as Mosby.
- Site location, i.e. Effect of elevation, distance to bedrock, representation of watershed.
- Fire Weather, daily NWP models, climate.

REFERENCES

- Coon, King, Knowlton Engineers, Eckhoff,Watson, Preator Engineers, Horrocks and Corollo Engineers, James M. Montgomery Engineers and the Utah Division of Water Resources. 1982. Salt Lake County area-wide study.

- Julander, Randall P. and Sean Cleary, 2002, Soil Moisture Data Collection and Water Supply Forecasting. Proceedings of the Western Snow Conference, Sun Valley Idaho, April 16-19, 2001.

QUESTIONS???

THE END!

Thank ya’ll.