

2014 Drought Conference
Watsonville, CA
(April 10, 2014)

SOIL MOISTURE MONITORING 101

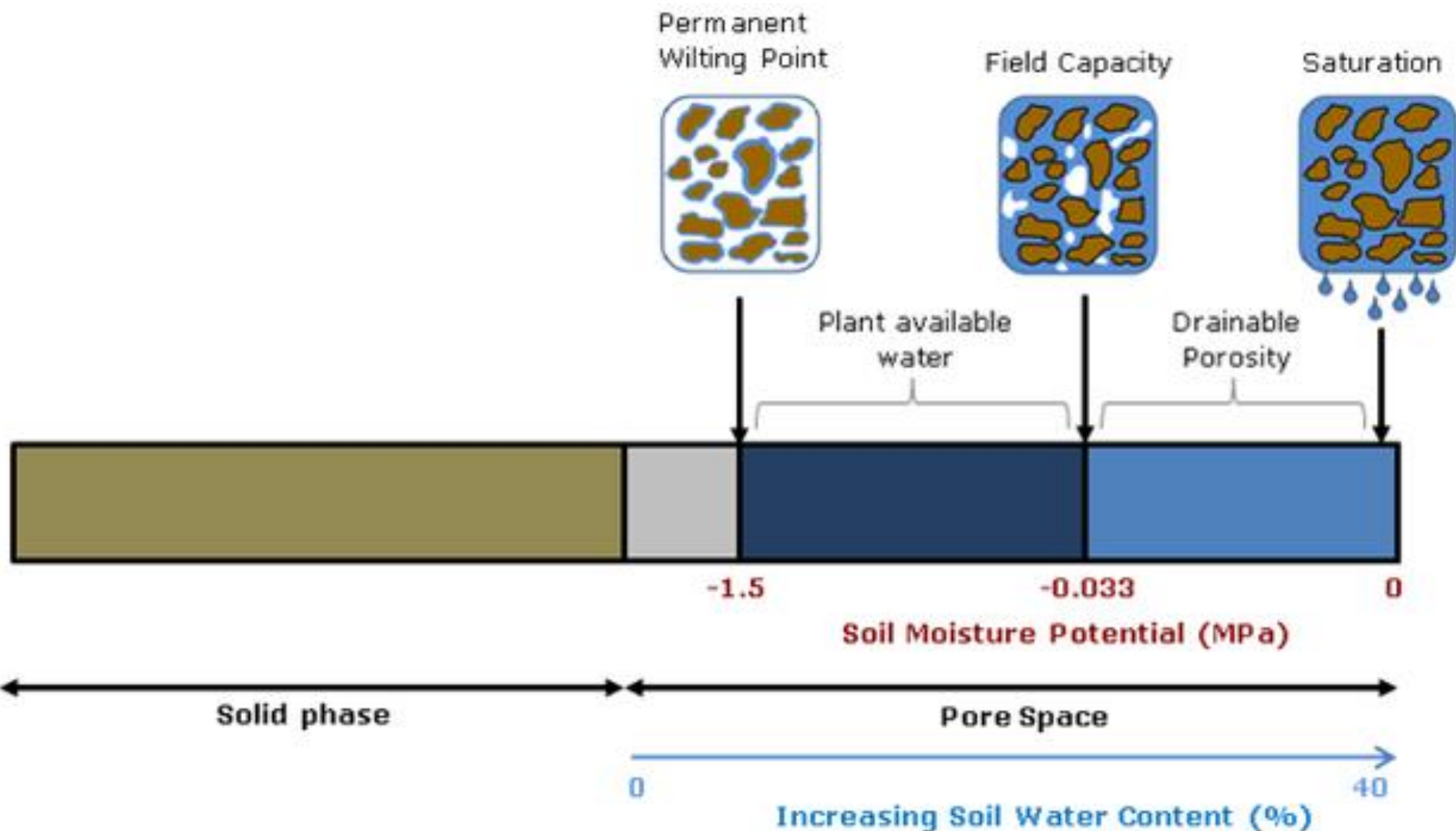
SOIL MOISTURE TENSION

- Affinity of the soil matrix for water
- Units:
 - Bars
 - Kilopascals
 - 1 Bar = 100 kilopascals

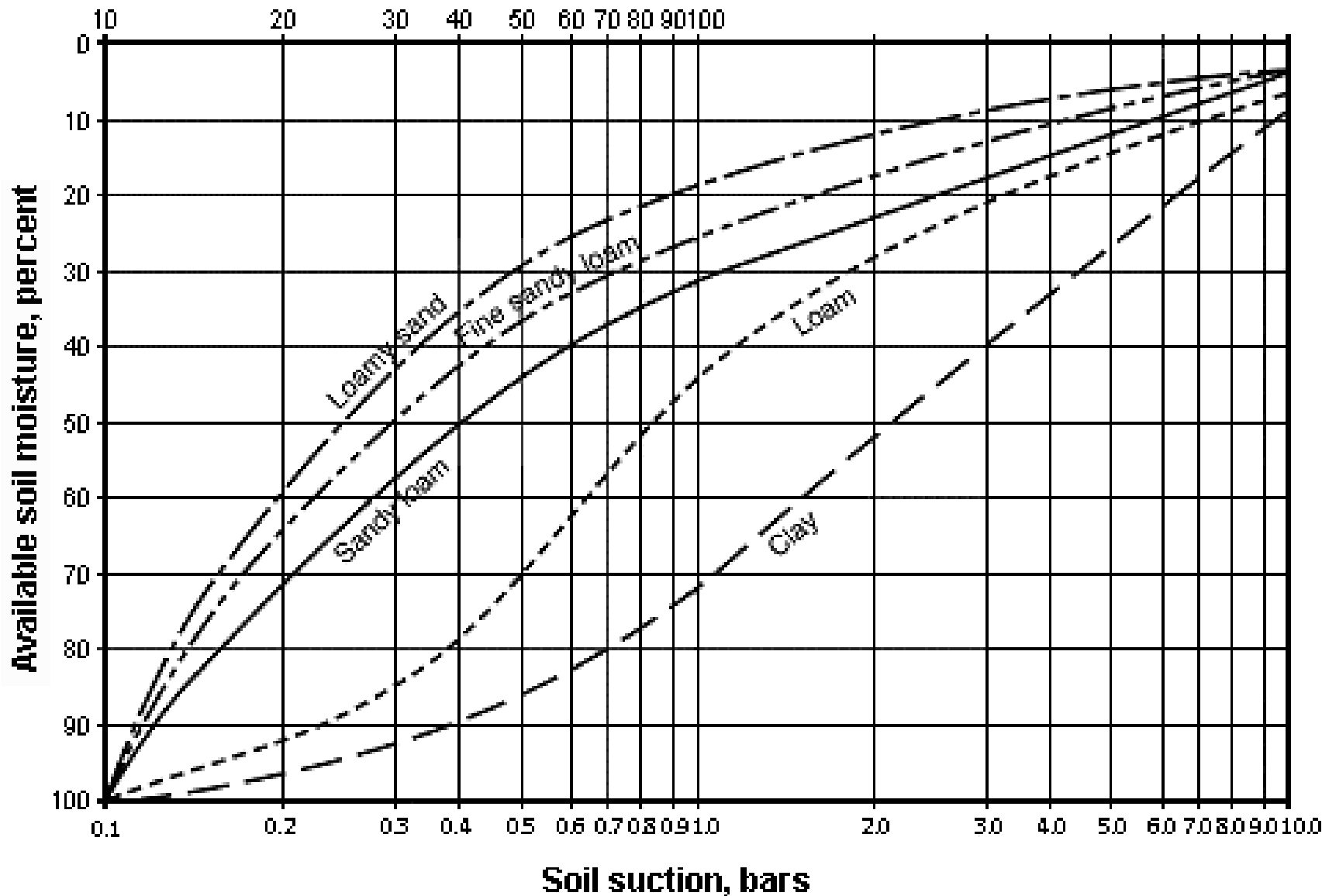
SOIL MOISTURE CONTENT

- Total amount of water in the soil
 - Percent water by mass (weight)
 - Percent water by volume
- Units:
 - Percent (%)
 - Lbs water / Lbs of soil
 - Gallons water/ Gallons of soil

TENSION vs. WATER CONTENT



Centibars



Adapted (with permission) from the *BC Trickle Irrigation Manual*, BC Ministry of Agriculture and Food, Irrigation Industry Association of British Columbia (T.W. Van der Gulik)

Note: 1 kpa = 1 centibar; 100 centibars = 1 bar

SOIL MOISTURE ASSESSMENT EQUIPMENT

- TENSION
 - Tensiometer
 - Watermark
- WATER CONTENT
 - Dielectric Method (TDR, FDR)

SOIL TENSION MONITORING

	Tensiometer	Watermark
Reading Range	0-0.8 bar	0.1-2.0 bar
Accuracy	± 0.01 bar	± 0.01 bar
Sphere of Influence	> 4 inches	0.8 inches
Affected by Salinity	No	> 6 dS/m
Maintenance	Yes	Medium
Cost	\$75 -\$250	\$200 -\$500

SOIL WATER MONITORING (TDR,FDR)

- Very accurate (0-saturation)
- Sphere of influence: 1.2 – 1.6 inches
- No affected by salinity
- No field maintenance
- Sensor cost (add logger)
 - TDR: \$400 - \$23,000
 - FDR: \$100 - \$3,500