SPECTRAL EVOLUTION

Measuring Soil Salinity

Regular measurement of soil salinity is important for efficient soil and water management especially in semi-arid or arid environments. Traditional methods use lab-based electrical conductivity (EC) testing of samples. EC tests can be expensive and time consuming. In addition, to get an accurate picture for a large area requires a large number of samples, as salinity can change rapidly from spot to spot. Hyperspectral and multi-spectral remote sensing can be used along with vegetation indices, however the usual issues with these images such as resolution, vegetation cover and atmospheric effects can leave a researcher without a clear and complete understanding.

The PSR+ can be used to measure the salinity of soil in semi-arid and arid environments.

Excess salinity in soil can decrease plant available water uptake and cause stress with a subsequent reduction in growth and yield in crops. Using a field spectroradiometer like the PSR+ to take measurements *in situ,* can provide more complete and accurate data. The PSR+ can capture the presence of NaCl with an absorption feature at 1930nm, KCl with an absorption feature at 1430nm, MgSO4 with a feature at 1480nm, Na2DO4 with a feature at 1825nm, and MgCl2 with a feature at 1925nm.

The PSR+ can also be used in conjunction with satellite or flyover imagery to offer a comprehensive understanding of soil salinity across an area. Spectra collected by a PSR+ spectroradiometer are saved as ASCII files for analysis using third party software, for example, R or a chemometrics package such as the Unscrambler from Camo Analytics. In addition, the PSR+ is available with Spectral Evolution's EZ-ID sample identification software and Custom Library Builder module so that researchers can create their own soil spectra library to match against unknown samples.

PSR+ provides high resolution and sensitivity in a field portable spectroradiometer.

The PSR+ spectroradiometer delivers fast, accurate, and flexible ways to measure salinity and moisture in soil, with:

- Fast collection of data in minutes with no sample prep or sample destruction
- Precision, accuracy, and a wealth of information—especially if the spectra are combined with statistical analysis software or chemometrics analysis
- Affordable measurement technology
- *In situ* measurement
- A range of accessories including contact probes and a benchtop probe with sample compactor

The PSR+ has a compact design for easier handling and use in the field.. Spectral resolution of our PSR+ is enhanced for high resolution scans for accurate soil spectra:

≤3.0nm @ 700nm (FWHM)
≤8.0nm @ 1500nm (FWHM)
≤6.0nm @ 2100nm (FWHM)

The PSR+ also offers improved electronic control circuitry for best-in-class NER (with 4° lens):

≤0.5 x 10^{-9} W/cm^2/nm/sr@ 400nm
≤0.8 x 10^{-9} W/cm^2/nm/sr@ 1500nm
≤1.0 x 10^{-9} W/cm^2/nm/sr@ 2100nm

26 Parkridge Road ◊ Suite 104
Haverhill, MA 01835 USA
Tel: 978 687-1833 ◊ Fax: 978 945-0372
Email: sales@spectralevolution.com
www.spectralevolution.com