



FrankenSoils (2) - Restoring "life". Strategies for the restoration of formerly contaminated lands

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Short description of the lecture:

Borrowing the name from a European myth, "FrankenSoils" represents a team of interdisciplinary scientists and engineers who integrate remediation and restoration strategies to restore "life" and economic value to contaminated lands.

Aggressive, thermal and/or oxidative remediation strategies are capable of destroying 99.9+% of hydrocarbon contamination in soils. While this approach is used in many former industrial lands, the strategy effectively renders the soil sterile and often nutrient-poor after remediation because of the conditions involved in the process (e.g., 100-1100°C in thermal remediation). Because of these changes, an integrated approach coupling soil and plant science, environmental engineering and ecology is required to reintroduce biological activity to soils after remediation. Typically, barren soil is colonised initially by pioneering microorganisms; however, in the case of smouldered soil (600-1100°C), microbe inoculation typically requires simultaneous nutrient inoculation to make up for post-remediation deficits. After many generations of microbe succession, organic carbon begins to accumulate, conditioning the soil and increasing its fertility. As soil fertility increases, soil reaches the stage of ecesis where pioneering plants colonise the surface soil and establish robust nitrogen, phosphorus, and carbon cycling.

This lecture series explores the issues of engineered biological succession in post-remediation soils with a view toward remediation as a holistic endeavor that ends with full restoration of the impacted environment. While the focus is on thermal (smoulder) remediation efforts, the principles are based on natural ecology and could be translated to restoration efforts of many types of barren lands.



Contents:

1. Review of remediation strategies (1 hour)
2. Soil nutrition, biogeochemistry and toxicology
3. Ecological succession
4. Restoration strategies (2 days)
5. Integrated land management strategies

Terminy wykładów			
Data	Dzień tyg.	Godzina	Sala
2015-06-22	Pn	12.15-15.00	Hydro P1
2015-06-23	Wt	12.15-15.00	Hydro P1
2015-06-24	Śr	12.15-15.00	Hydro P1
2015-06-25	Cz	12.15-15.00	Hydro P1
2015-06-26	Pt	12.15-15.00	Hydro P1