# Characterization of black (pyrogenic) carbon in forest soil organic matter. (S07-preston171427-Oral)

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### Abstract:

Forest fires, especially boreal wildfires, generate pyrogenic carbon (also called char or black carbon, BC) that may contribute to the very stable soil carbon pool. Current BC research includes analytical methodology, ecological function, and quantification of stocks and fluxes, but there is little direct characterization or quantification of BC generated in forest fires and the effects of weathering and/or burial. Solid-state C-13 NMR provides a fingerprint of total sample carbon, but the high aromaticity of BC requires high-speed spinning and quantitative Bloch decay acquisition in addition to normal CP. We have characterized BC samples from a range of substrates, forest ecosystems (British Columbia Rocky Mountain Trench, the Canadian Boreal Forest Transect Case Study in Saskatchewan and Manitoba, and central Siberia), and ages from a few days to >1000 years of burial or incorporation into soil fractions. Laboratory and field char samples appear to have a structure of small clusters of fused aromatic rings, rather than the larger domains in soot or graphite. We also compared conversion of forest floor to BC in a Siberian wildfire; by NMR and by a more selective chemical method.

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## **Presentation Information:**

Presentation Date: Tuesday, November 12, 2002 Presentation Time: 2:15 pm

## **Keywords:**

NMR, black carbon, organic matter, fire