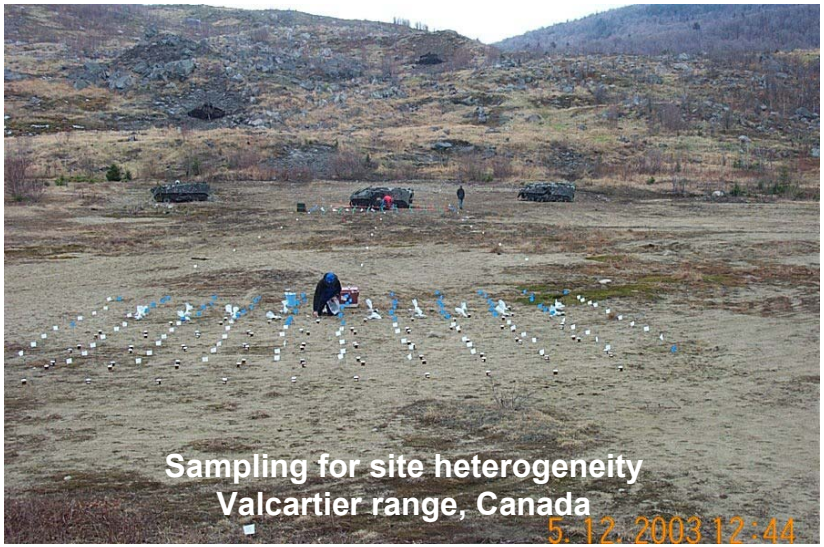
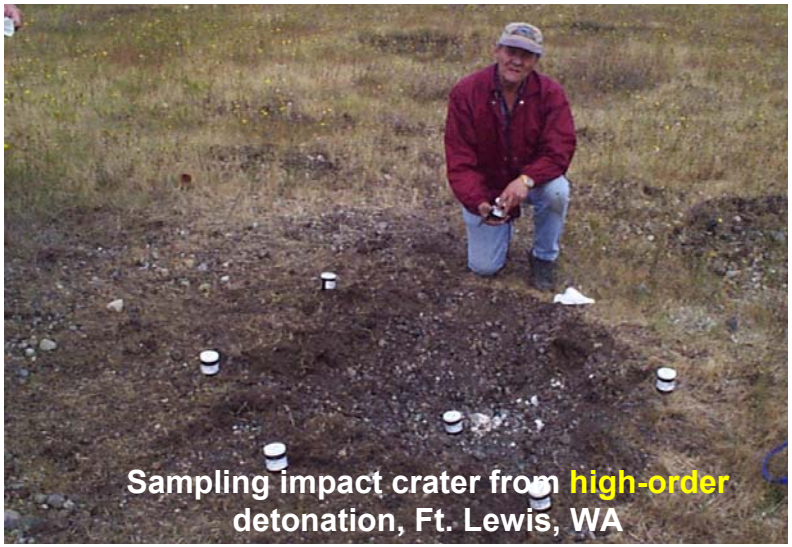
Determining Explosives Residues on Ranges

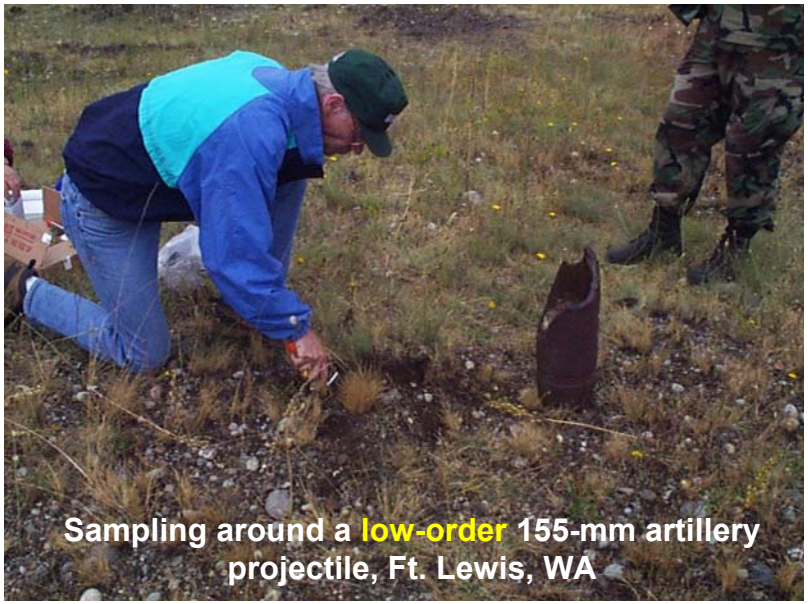


Sampling for site heterogeneity
Valcartier range, Canada



Sampling impact crater from high-order detonation, Ft. Lewis, WA

Sampling residue on snow surface after high- order detonations, Ethan Allen, VT



Sampling around a low-order 155-mm artillery projectile, Ft. Lewis, WA

Determining Explosives Residues on Ranges

Estimates of Residues

	RDX	TNT
Live-Fire High-Order Detonations (% Deposited)		
M67 Hand Grenade	$2x10^{-5}$	<dl
105-mm Howitzer	$7x10^{-6}$	$2x10^{-5}$
60-mm Mortar (Point Detonation)	$6x10^{-5}$	<dl
60-mm Mortar (Proximity)	$3x10^{-5}$	$1x10^{-5}$
81-mm Mortar	$2x10^{-3}$	$3x10^{-4}$
120-mm Mortar (Point Detonation	$2x10^{-4}$	$2x10^{-5}$
Blow-in-Place, High-Order Detonations (% Deposited)		
M67 Hand Grenade	$7x10^{-4}$	$2x10^{-3}$
81-mm Mortar	$3x10^{-3}$	$6x10^{-5}$
155-mm Howitzer	not present	$2x10^{-1}$
C4 alone	$3x10^{-3}$	not present
PMA-1A Landmine	not present	$3x10^{-1}$
PMA-2 Landmine	$8x10^{-3}$	$3x10^{-1}$

Determining Residues from Blow-in-place (BIP)

- C4 versus shaped charges
- C4 versus various other techniques

60-mm mortar with overlay of C4

60-mm mortar with shaped charge

60-mm mortar with binary donor

60-mm mortar with binary donor

Setup for C4 alone