Streamflow generation mechanisms

1. Infiltration Excess
   Overland Flow

2. Saturation Overland Flow

3. Subsurface Storm Flow
   (also called interflow)

4. Groundwater Flow
Subsurface storm flow is common in humid, temperate, forested areas.
Subsurface Storm Flow

- Water moves rapidly through preferential flow paths (macropores)
- Can be vertical or lateral

Sidle et al 2001 HP
Hydraulic conductivity decreases with depth

...Water forced to move laterally

\[ y = 170.44e^{-0.006x} \]

\[ R^2 = 0.7467 \]

Replotted from Harr 1977
Precipitation continues to infiltrate the soil raising the level of interflow.
Saturated wedge contributes to stormflow

Weyman, 1973
• Wedge often develops at soil-bedrock interface
• This wedge is often perched relative to regional water table.

(following Beven, 2001)
Subsurface storm flow (SSF) (also called interflow)

- Occurs where hydraulic conductivity decreases with depth
- Water forced to move laterally
- Saturated “wedge” contributes storm flow

Weyman, 1973