Overview of model runs

• Choosing and defining initial landsurfaces (BB)
• Climate inputs (BB)
• Creating a climate timeseries (GM)
• Model runs (GM)
• Map outputs (GM)
• Synthetic borehole outputs (GM)
• Comparison of synthetic and real boreholes (BB)

MODEL INPUTS - LANDSURFACES
Initial land surfaces

Two 'end-members'

- Base of first terrace deposits
- Present day land surface
North-south cross section across fan at upper end

Land surface 1: base of first terrace deposits
Climate records for the last glacial-interglacial cycle

- NGRIP ice core
- Welland river basin
- Grande Pile pollen record
Climate records for the last glacial-interglacial cycle

Creating a combined Grande Pile / NGRIP climate timeseries (GM)
Model runs

- Landsurface 1: base of first terrace deposits
  - Standard climate time series (timestep 400 years)
  - ‘Noisy’ climate time series (timestep 400 years)
- Landsurface 2: present day land surface
  - Standard climate time series (timestep 400 years)
  - ‘Noisy’ climate time series (timestep 400 years)
Example slope map (135,000 years BP)

Digital elevation model - 112,000 years BP
Soil depth map - 112,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 105,000 years BP
Soil depth map - 105,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 95,000 years BP
Soil depth map - 95,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 90,000 years BP
Soil depth map - 90,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 73,000 years BP
Soil depth map - 73,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 60,000 years BP
Soil depth map – 60,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 31,000 years BP
Soil depth map – 31,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 17,000 years BP
Soil depth map – 17,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 9,000 years BP
Soil depth map – 9,000 years BP

Blue = thicker
Yellow = thinner

Digital elevation model - 8,000 years BP
Soil depth map – 8,000 years BP

Blue = thicker
Yellow = thinner

MODEL OUTPUTS – SYNTHETIC VS. REAL BOREHOLES
Gibbons real borehole

- Soil
- 9 - Late-glacial silty sand (post 10 ka)
- 8 - Late-glacial shallow braided (10-15 ka)
- 7 - Last Glacial Maximum wedge forms (16-30 ka)
- 6 - Middle Devensian scour-forms (30-40 ka)
- 5 - Early to Middle Devensian shallow braided (50 - 60 ka)
- 3 - Early Devensian scour-dominated braided (50 - 95 ka)
- 2 - Early Devensian shallow braided (95 - 111 ka)
- 97 - Oxford Clay and Kellaways Beds

Synthetic Gibbons borehole

- 30-40 ka
- 50-60 ka
- 60-95 ka
- 95-111 ka