Pleistocene Extinctions

Pleistocene Midwestern Animals

- Insectivora (shrews and moles)
  - Arctic Shrew (still found in MN and WI)
  - Northern Water Shrew (still found in MN and WI)
  - Starnose Mole (still found in MN and WI)
  - Hairytail Mole

- Edentata (sloths, armadillos, and anteaters)
  - Ground Sloths (extinct)
  - Beautiful Armadillo (extinct)

- Carnivora (lions, tigers, and bears)
  - Short-faced Skunk (extinct)
  - Dire Wolf (extinct)
  - Short-faced Bear (extinct)
  - American Lion (extinct)
  - Jaguar
  - Saber-toothed Cats (extinct)

- Rodentia (squirrels, rats, mice and beavers)
  - Giant Beaver (extinct)
  - Northern Grasshopper Mouse
  - Northern Bog Lemming
  - Mountain (Heather) Phenacomys
  - Boreal Redback Vole
  - Yellow-cheeked Vole
  - Porcupine

- Lagomorpha (rabbits and hares)
  - Snowshoe Hare (still found in MN and WI)

- Perissodactyla (horses, rhinos, and tapirs)
  - Horses (extinct in North America)
  - Tapirs (extinct in North America)

- Artiodactyla (deer, cows, sheep, camels, and pigs)
  - Peccaries (extinct)
  - Stag-moose (extinct)
  - Bison
  - Musk Ox (some types extinct)

- Proboscidea (elephants)
  - American Mastodon (extinct)
  - Mammoths (extinct)

Timing in NAm

Extinction Patterns
23 genera of large mammals went extinct over a period of 3 million years, prior to Wisconsin glaciation. At the end of Wisconsin glaciation, 33 genera go extinct in a shorter period, all members of 7 families, including Proboscideans, Equids and Cameloids. Large mammals including giant wombats and kangaroos and the hippo-sized Diprotodon went extinct. Extinctions of giant birds are only a few thousand years old and clearly correspond to the arrival of humans.

Three Extinction Hypotheses

- Humans are to blame
- Climatic changes and biotic instability are to blame
- As of 2007, new hypotheses involving Bison bison
Human Overkill
(Larry Martin)
- Extinctions seem to follow the appearance of humans in different parts of the world.
- Extinctions mainly seem to be in the megafauna.
- "Climatic explanations are implausible".

Why?
- The first is that human overhunting directly caused the extinction.
- The second is that overhunting eliminated a "keystone species" (usually the mammoths or mastodon) and this led to environmental collapse and a more general extinction.

Why no significant late Pleistocene extinctions in Africa where humans had been around for a long time.
- Hunting induced extinctions should leave abundant evidence of killsites - yet there are none.
- The hypothesis fails to explain the simultaneous extinctions of mammalian and avian species not obviously vulnerable to human overkill.
- Predicts ranges of megafauna should constrict as a semicircular front of approaching hunters comes in contact with them. This is not the pattern we see in the extinctions which see the reverse.

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Climate/Environment
- A number of extinctions take place, each seem to be correlated with climate changes.
- Argues that extremely rapid decline in non-exploited mammal species and extinction patterns indicate climate differences.
- It is not just climate changes, but the accompanying biotic reorganization of biotas that drastically alter biomes.
- Climate and environmental changes but no extinction patterns.

Main problem is that this is difficult to test.
Bison bison

- 2007 SVP meeting new hypothesis floated that seems to make sense
- Now know that the modern bison didn’t appear until ca 200ka - during the last ice age
- Apparently earlier bison don’t show the giant herd capability of the modern bison
- Hypothesis is that modern bison exploded during deglaciation and basically stressed ecosystems

Conclusion

More than likely that climate and human interaction - exacerbated by modern bison in North America - are to blame (depending on when and where the extinctions occurred).