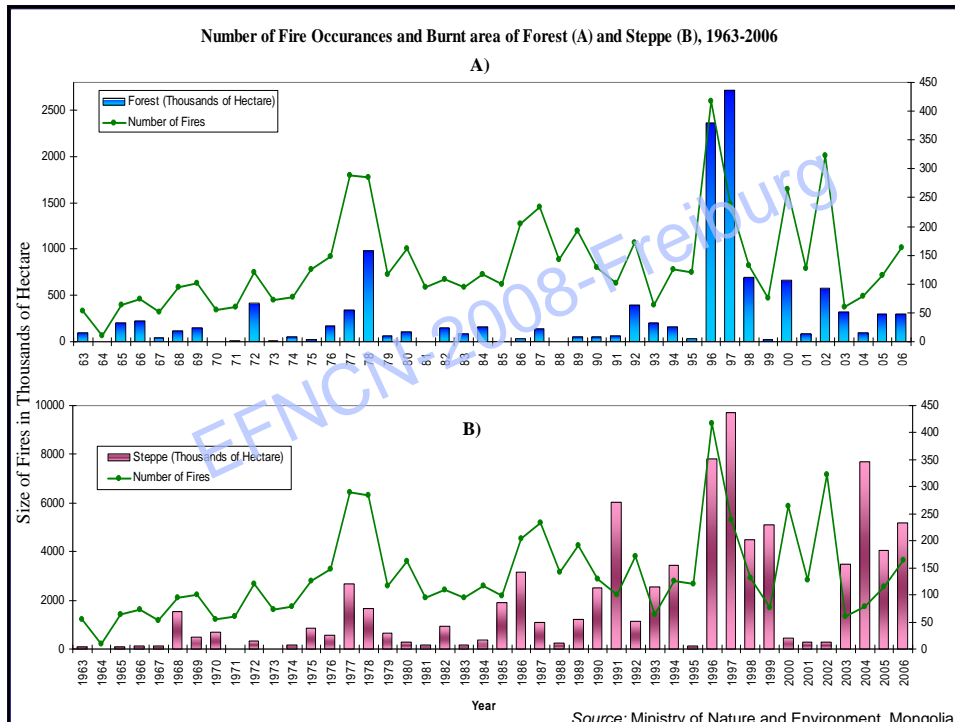


Symposium on Fire Management  
in Cultural and Natural Landscapes, Nature Conservation and Forestry  
in Temperate-Boreal Eurasia, 25-27 Jan, 2008, Freiburg, Germany

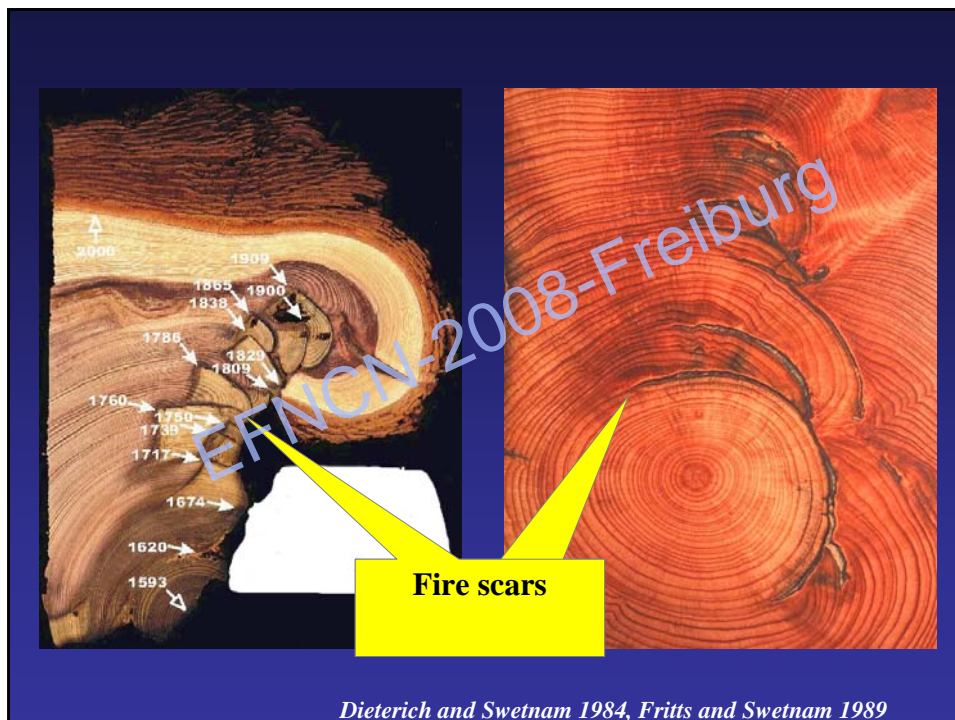
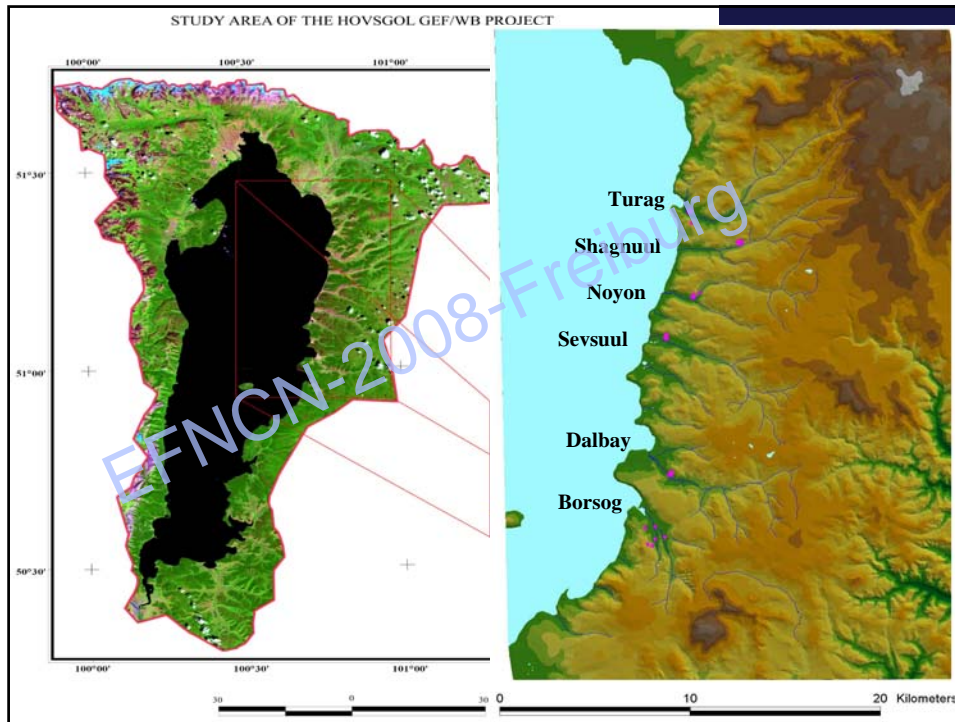
## Forest Fire Dating in Northern Mongolian forest

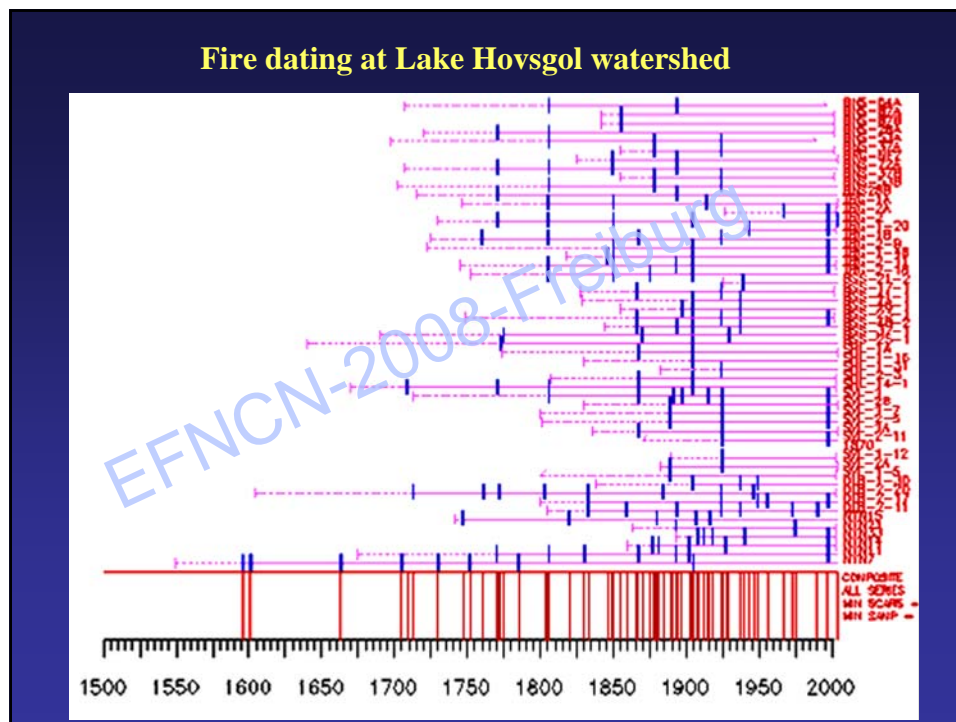
Oyunsanaa B\*, Baatarbileg N\*\* & Chuluunbaatar Ts\*\*\*

\*Centre for Nature Conservation  
Georg-August-University, Goettingen, Germany  
\*\*National University of Mongolia  
\*\*\*Mongolian State University of Agriculture









**We cross-dated 86 samples and recorded 102 fire scars (years) while identifying each fire scar season in the eastern Hovsgol during the 1549 to 2006 period**

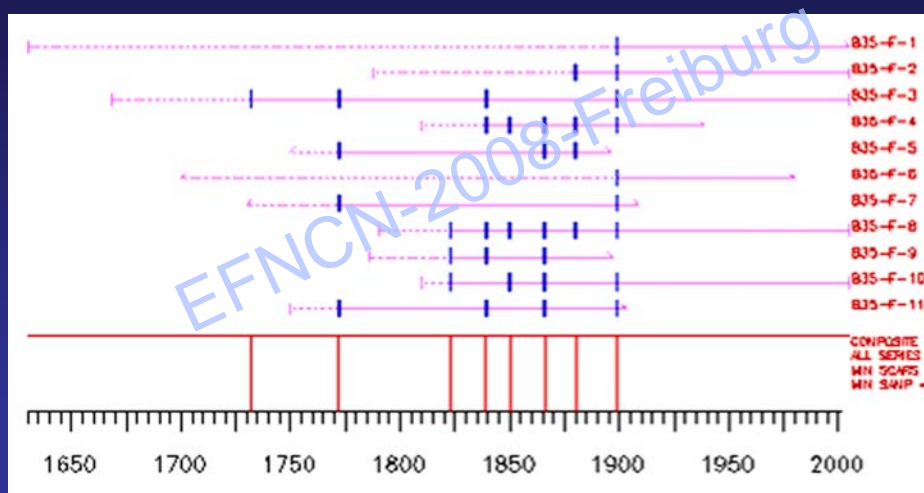
**Fire seasonality analysis are following;**

- In dormant season (D) - 18.8%,
- Early early wood (E) - 46.9%,
- Middle early wood (M) - 9.4%,
- Late early wood (L) - 12.5%

18 7 2005



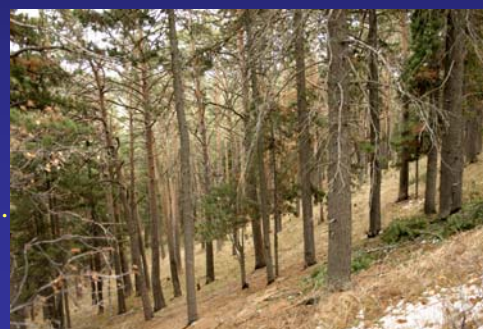
### Fire dating at Bugant region (Selenge province)





## Bogd Mountains

- North-central Mongolia (47° 49' N, 106° 50' E)
- Steppe-forest ecotone, 1750 m a.s.l.
- Grass (*Poa* spp.) understory
- Protected in 1749
  - No cutting, grazing, hunting or yahoos, but...





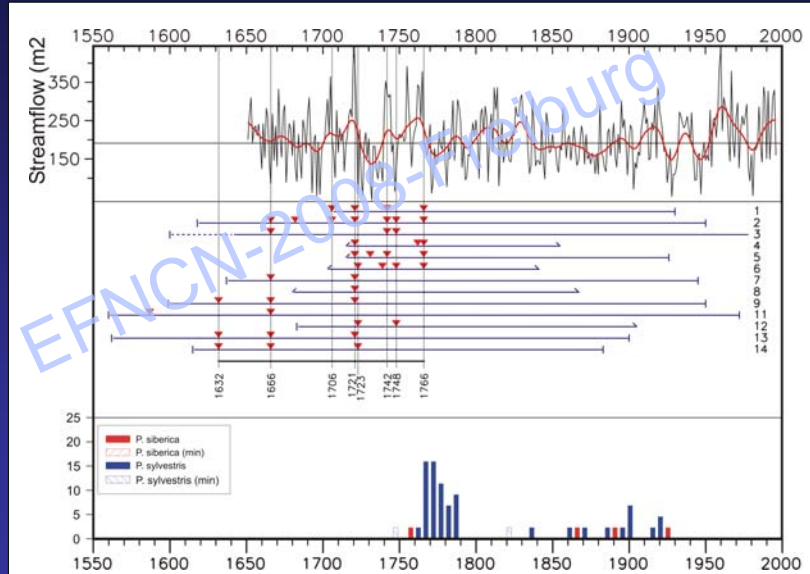
## Fire Dating Results

- 14 fire-scarred cross sections
- 41 total fire scars
- No lightning scars seen
- 8 total fire years
- 5 major fires ( $\geq 3$  trees scarred)
- First fire 1632; Last fire 1766
- Nearly all dormant season scars
- MFI = 15; range = 2 – 45
- $\geq 2$  with scars = 30, range = 6 – 55

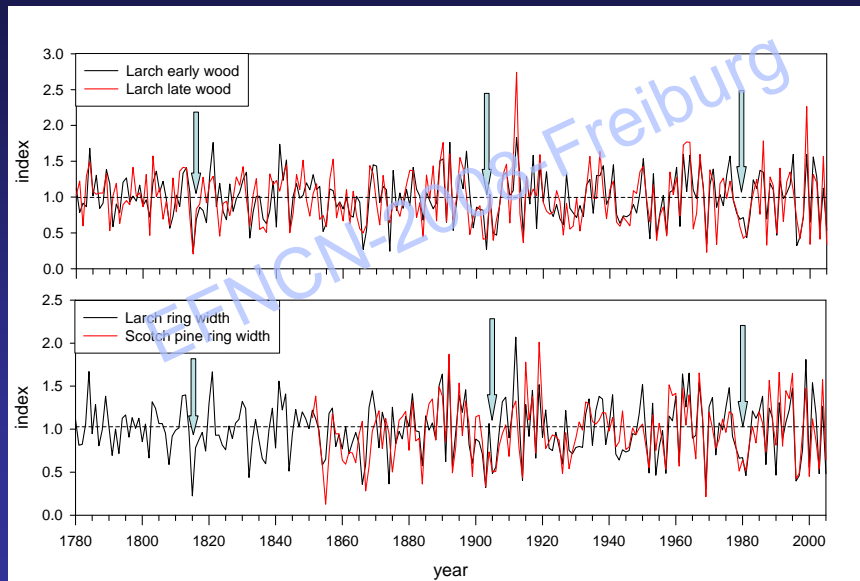
## Results: Age Structure

- Shift in dominance from *P. sylvestris* to *P. siberica* following cessation of fires in 1760's
- Establishment pulse following fire
- Few or no visible seedlings or saplings (i.e., no current regeneration)

### Results: Fire Scars, Tree Recruitment, and Climate

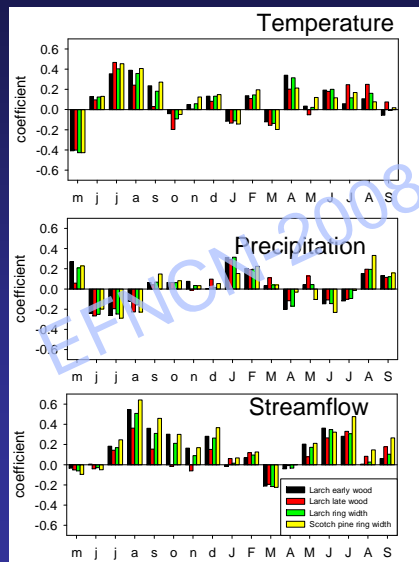


### Results: Tree Growth and Climate





## Results: Tree Growth and Climate

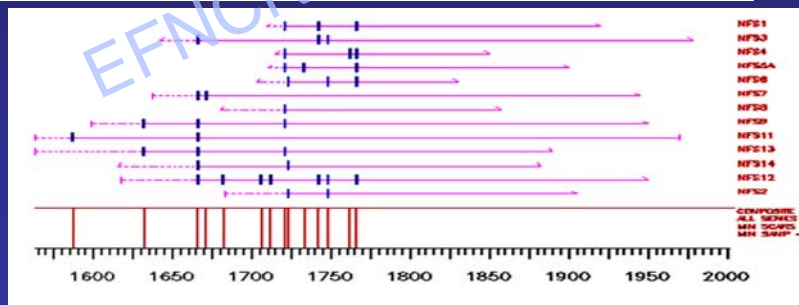
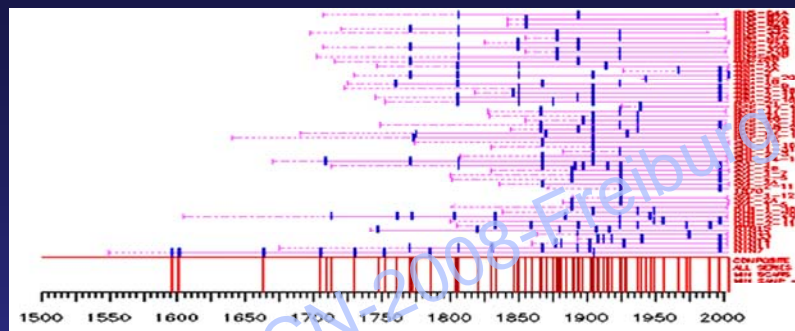


•Instrumental data 1940-1995

•Both species (*Larix sibirica* and *Pinus sylvestris*) sensitive to climate

- Previous year summer temp.
- Less correlation, precip.
- Strongest with stream flow: summer previous year, current growing season

### Fire dates at Lake Hovsgol watershed



### Fire dates at Bogd mountain

## Discussion

- Mainly, Mongolia has two fire seasons – a spring fire season where almost all fires are human caused, and a short, less intense fall season again entirely human caused.
- Reconstruction of the fire history based on tree-ring data provide valuable information on reference conditions of fire regimes prior to widespread Mongolian forests and its associated disturbances.
- Land management or well protection is helps to prevent fire

## Discussion

In Bogd mountain:

- Frequent surface fires before 1760
  - Spatial heterogeneity
- Cessation of fires in 1760's
  - Climate change
  - Human ignition source disappears
  - Increase in grazing reduces fine fuels
  - Fuel wood collection reduces coarse fuels
  - Fire suppression beginning ~1950
- Further historical fire studies in whole country is needed



EFNCN-2008-Freiburg