



# Uncertainty of land use change maps

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# Uncertainty of land use change maps

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Land use/change data sets:

1. HYDE

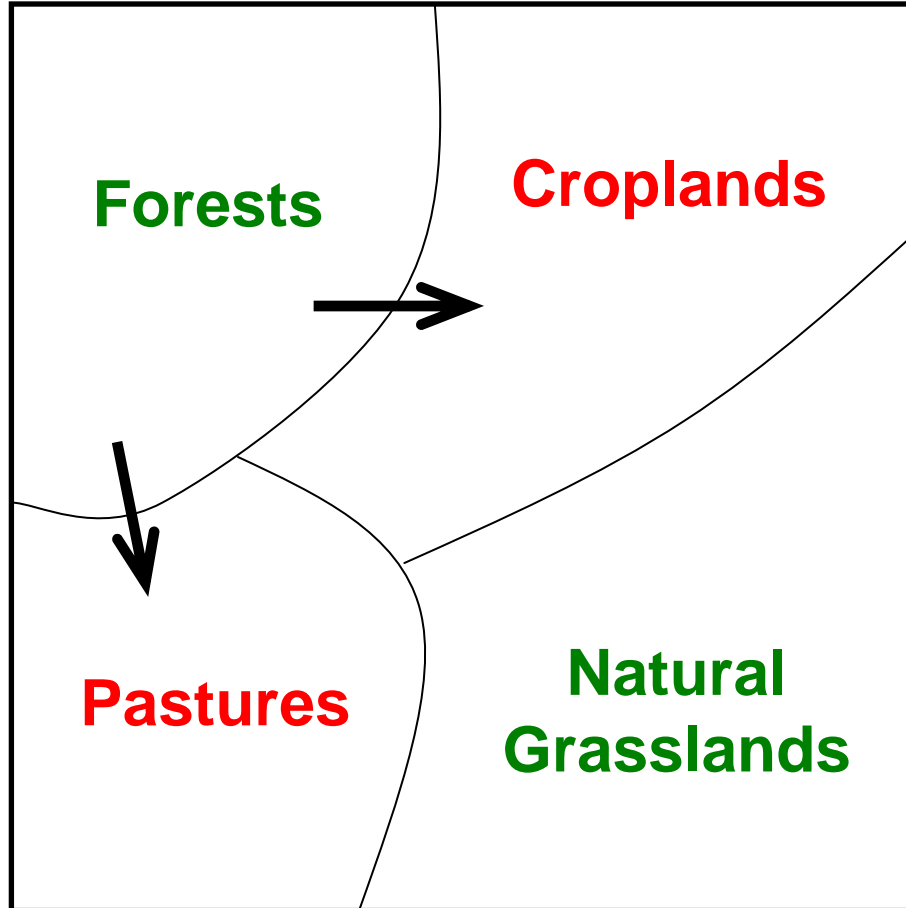
2. Hurtt

3. Pongratz

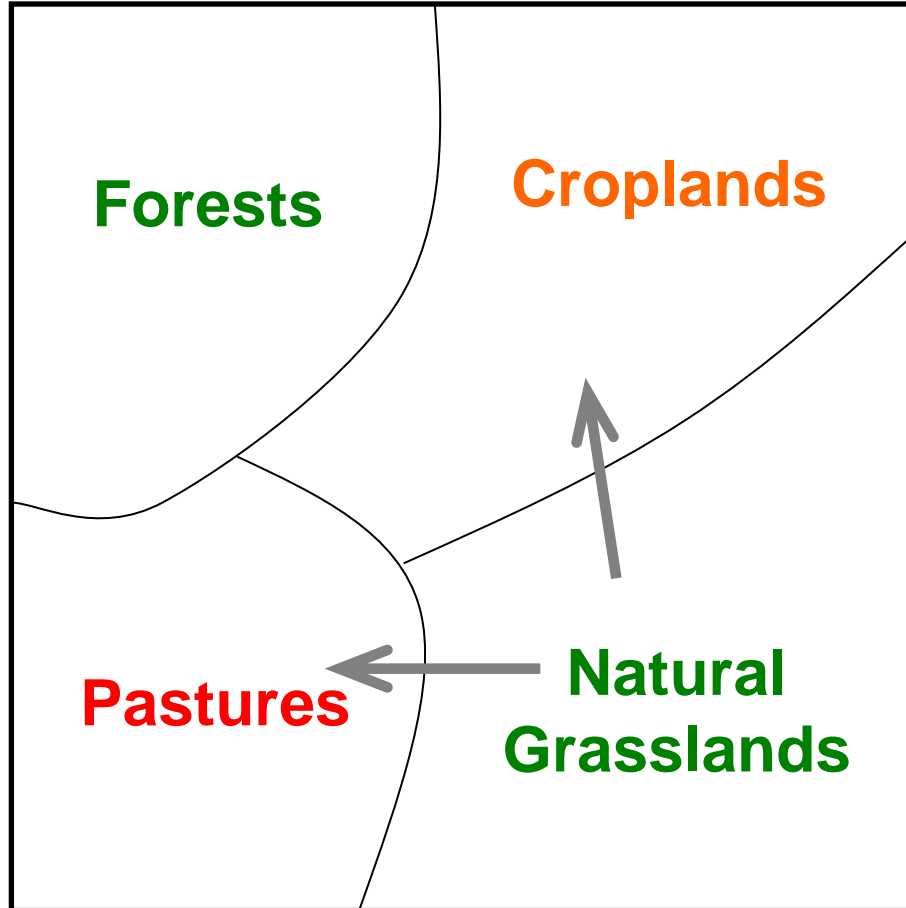
...

**How to implement LAND USE data into LAND COVER MAP?**

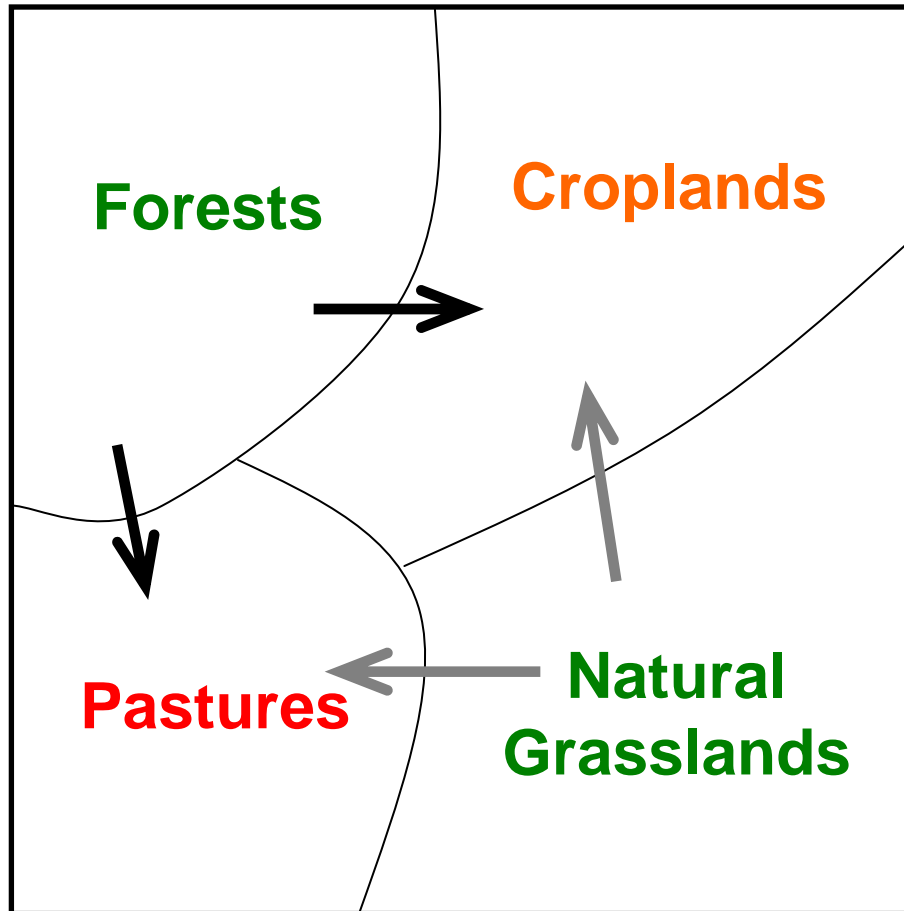
# Where did croplands/pastures come from?



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# Datasets and Methods

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ESA CCI 300m 2005 land cover map

Hurtt LUH 1500-2005 land use change maps

**Backward: 2005 ---> 1500**

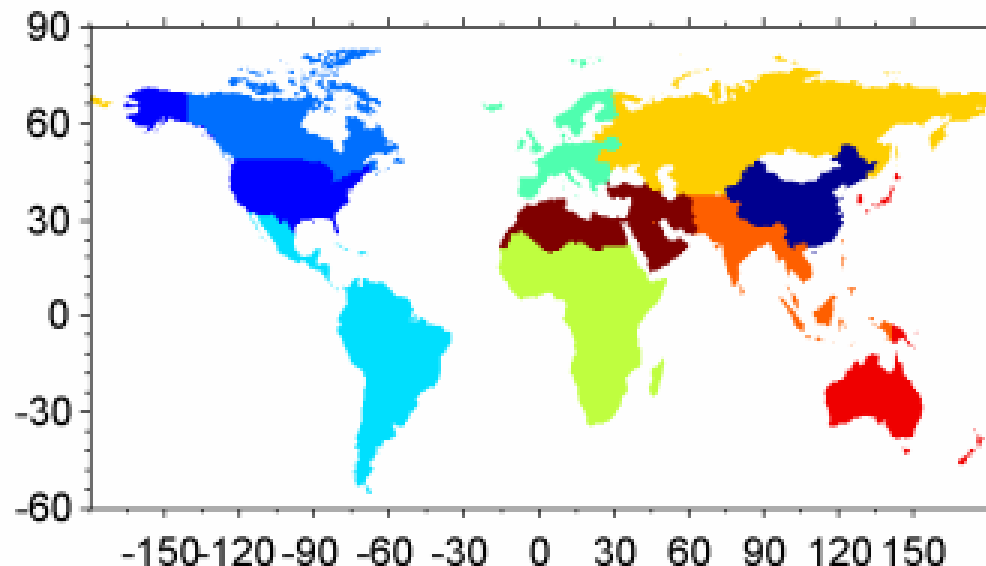
- 1. Croplands priority from grasslands, then from forests**
- 2. Croplands priority from forests, then from grasslands**
- 3. As #2, but constrained by Houghton's deforestation data**

# Datasets and Methods

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# Datasets and Methods

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**Backward: 2005 ---> 1500**

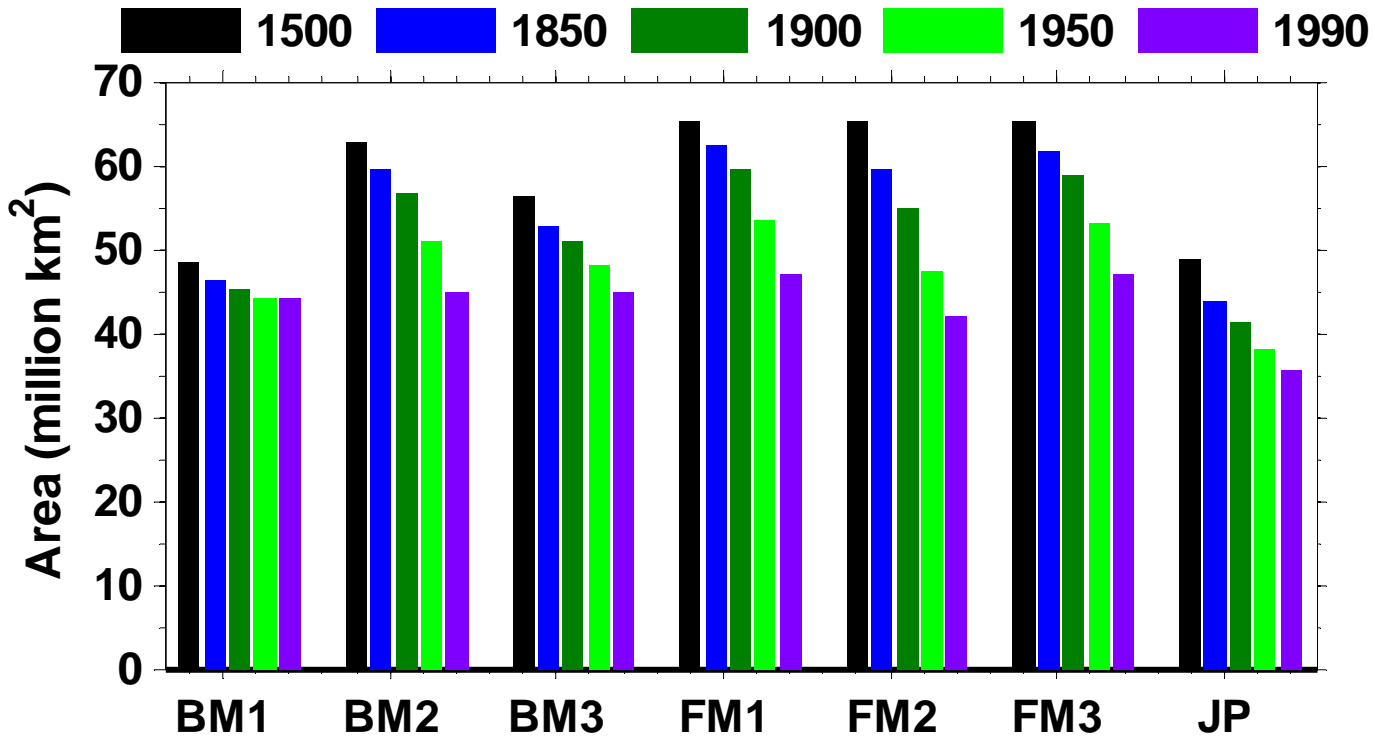
1. Croplands priority from grasslands, then from forests
2. Croplands priority from forests, then from grasslands
3. As #2, but constrained by Houghton's deforestation data

**Forward: 1500 ---> 2005**

1. Croplands priority from grasslands, then from forests
2. Croplands priority from forests, then from grasslands
3. Croplands proportional from grasslands and forests

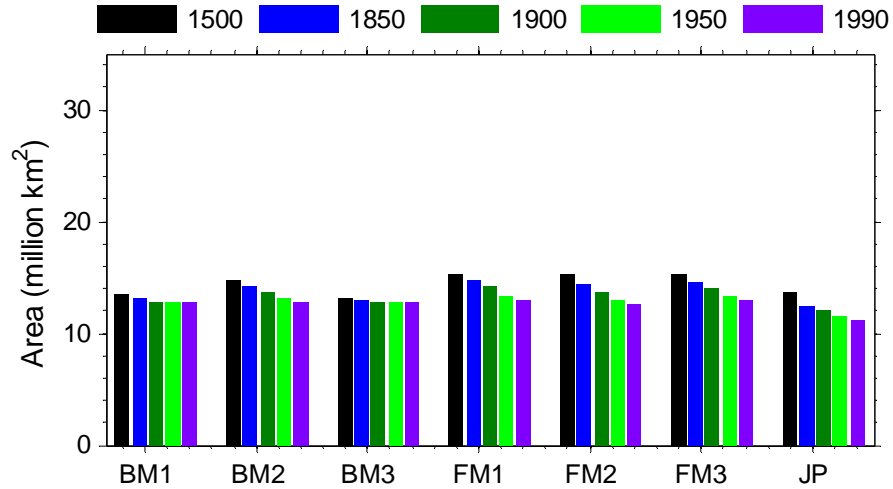


# Global total forest area

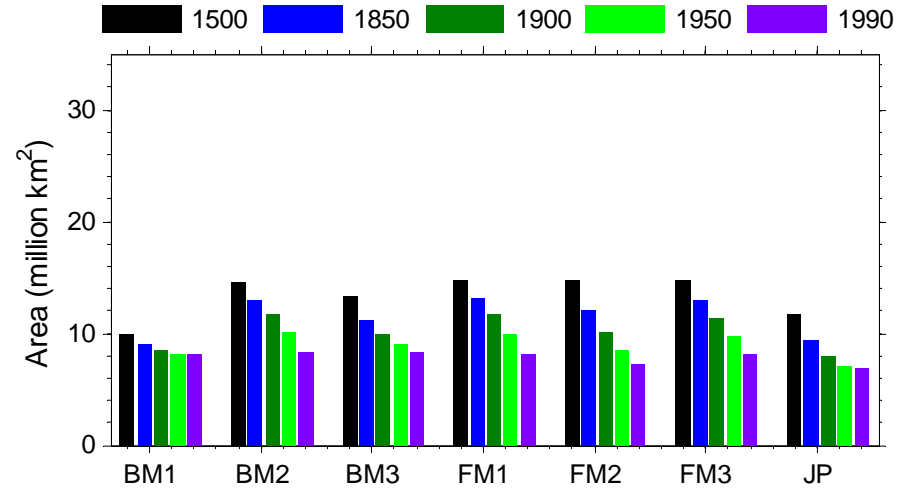


# Changes in forest area

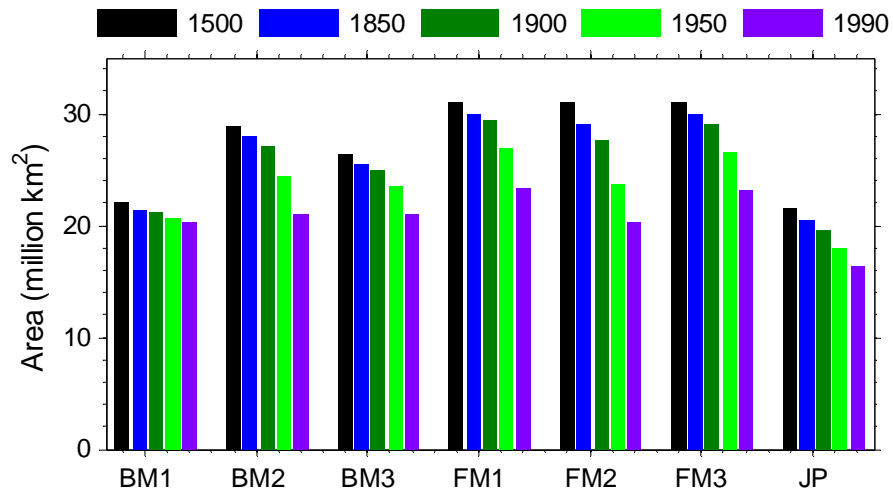
## Boreal



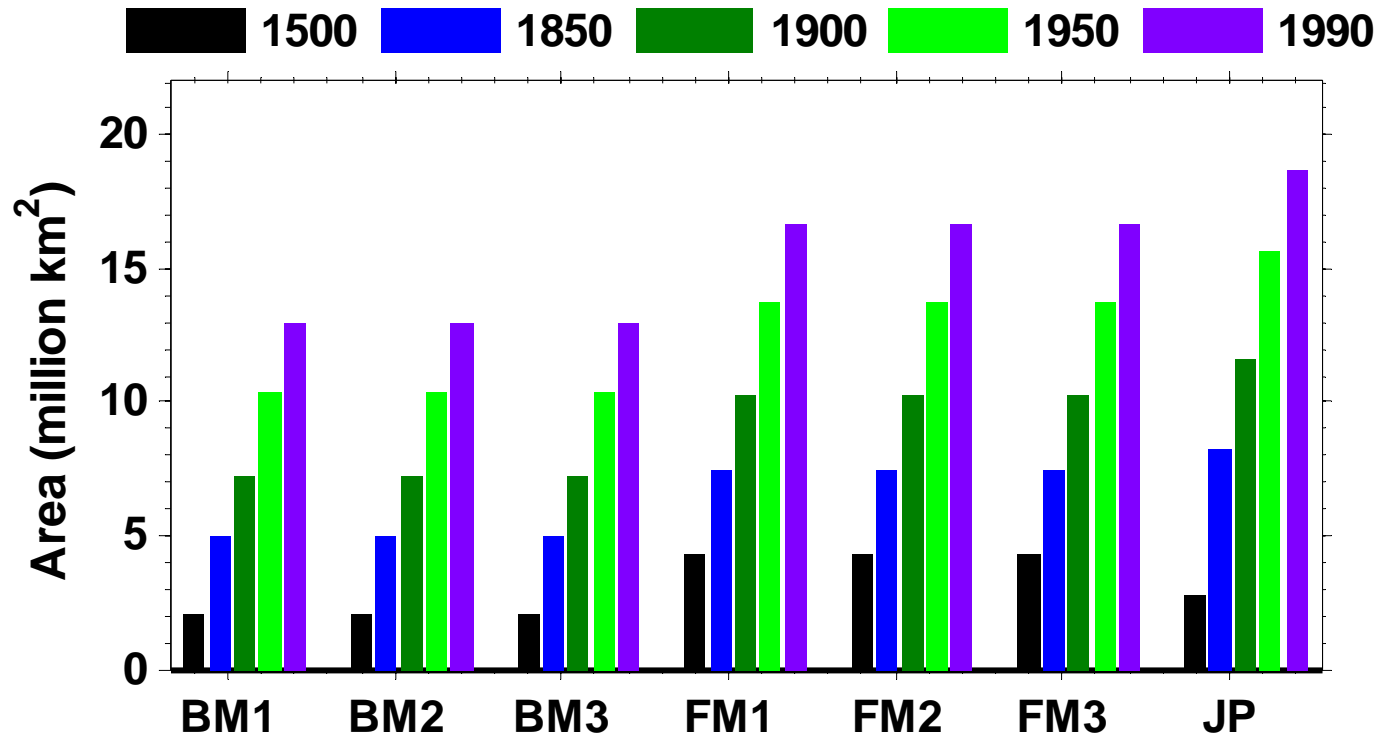
## Temperate



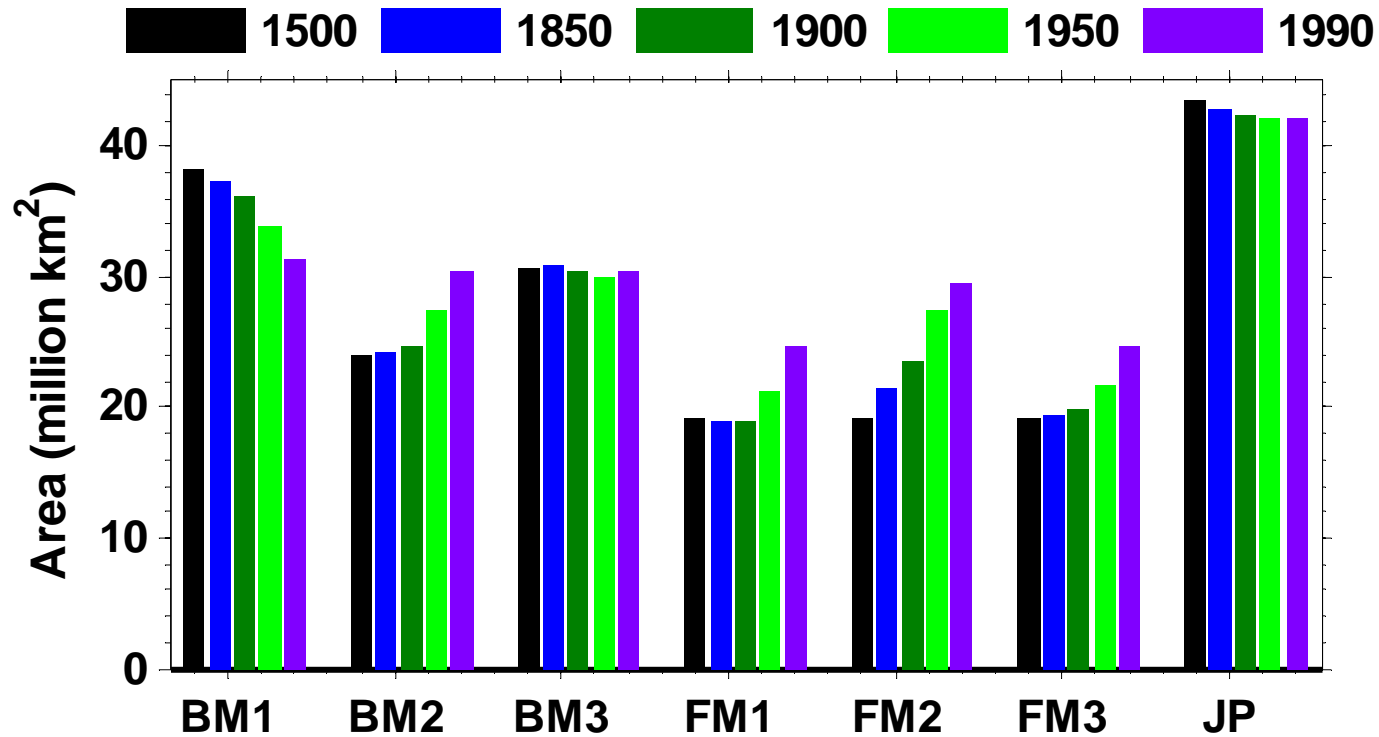
## Tropical



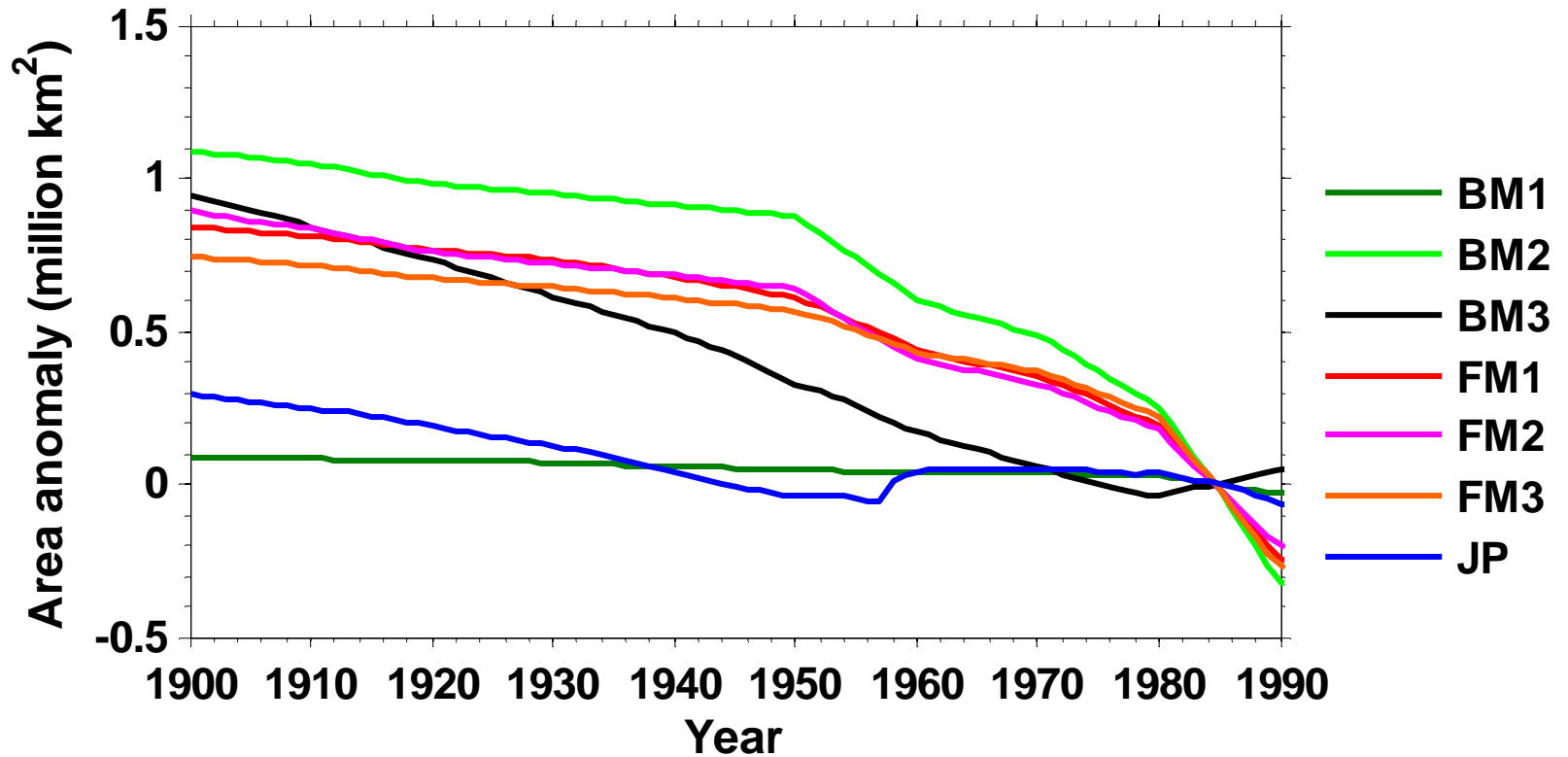
# Global total crop area



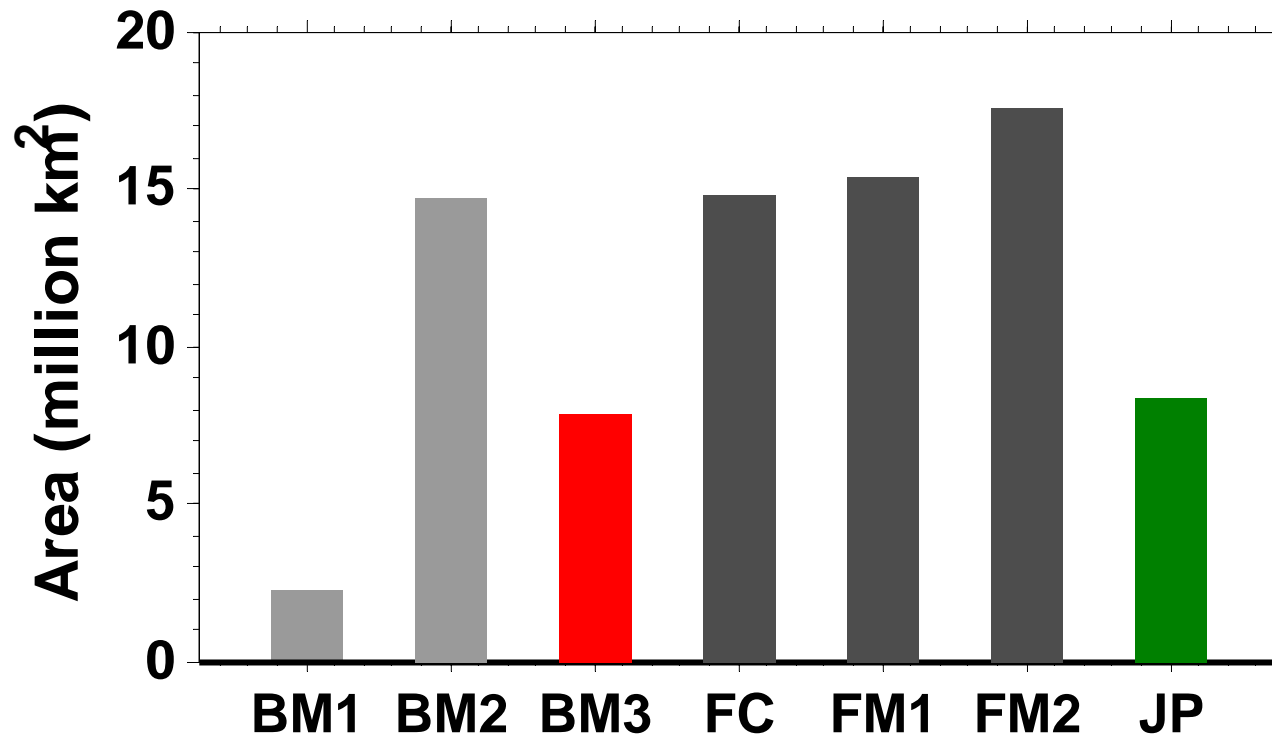
# Global total grassland (natural + pasture) area



# Change in China's forest area



# The difference in global forest area in 1850 and 1990



# Offline simulations with different LUC maps

S2: no land cover change, with land cover map in 1500

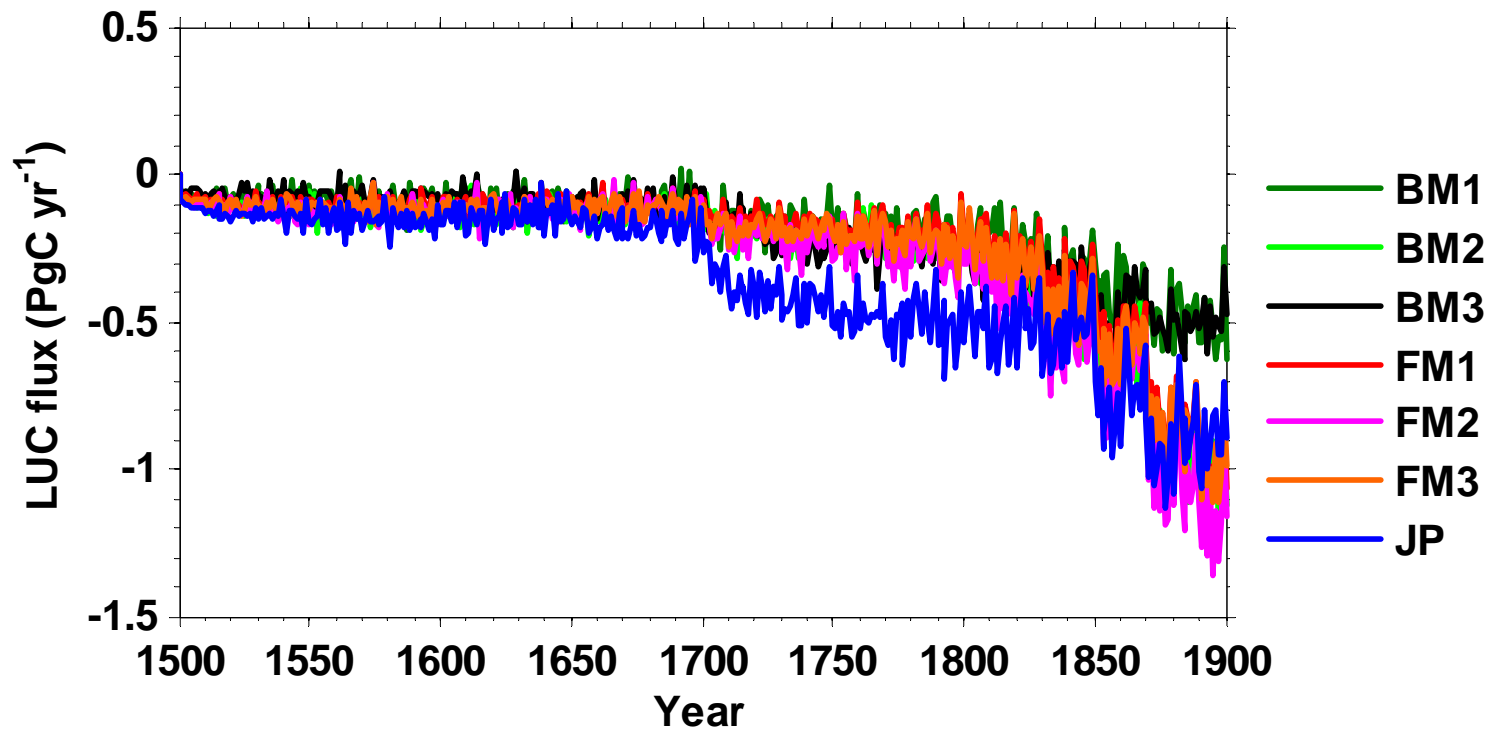
1. Spinup, 1901-1920 random climate + CO2 in 1500
2. 1500-1900 transient run, 1901-1920 cycle climate + CO2 1500 -1900
3. 1901-2005 transient run, 1901-2005 climate + CO2 1901-2005

S3: land cover change

1. Spinup, 1901-1920 random climate + CO2 in 1500
2. 1500-1900 transient run, 1901-1920 cycle climate + CO2 1500 -1900 + LUC
3. 1901-2005 transient run, 1901-2005 climate + CO2 1901-2005 + LUC

# LUC flux

Negative indicates carbon source





# LUC flux

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