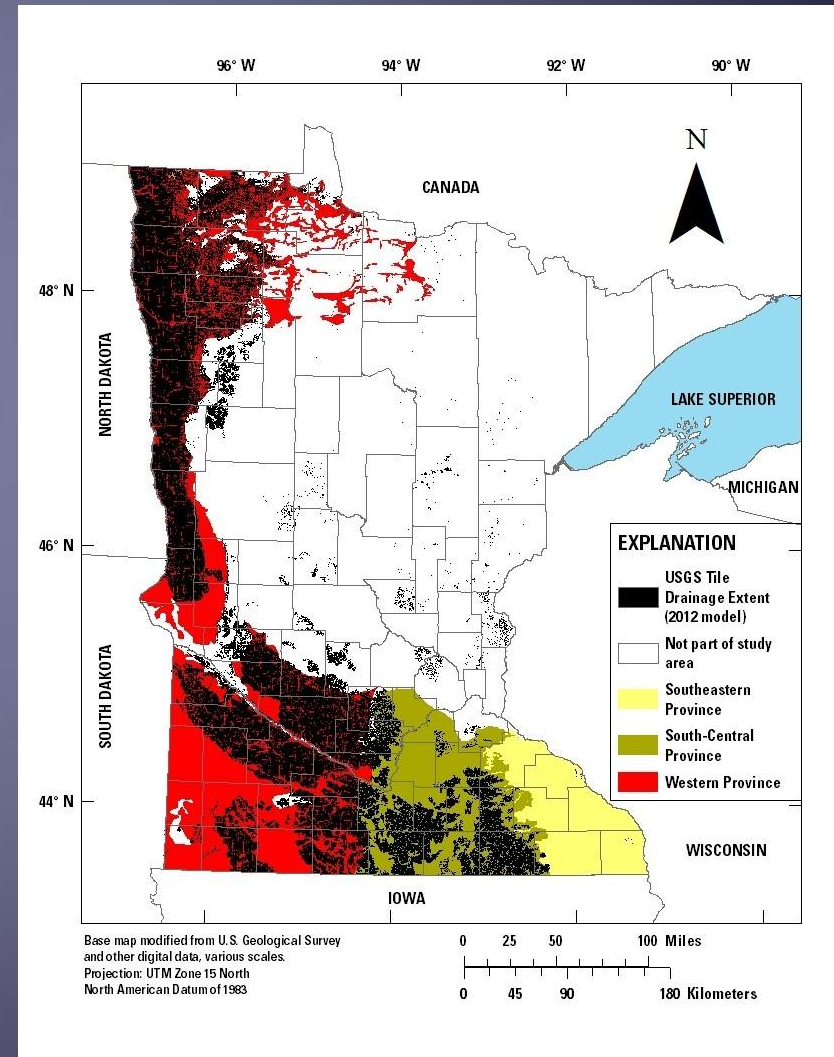
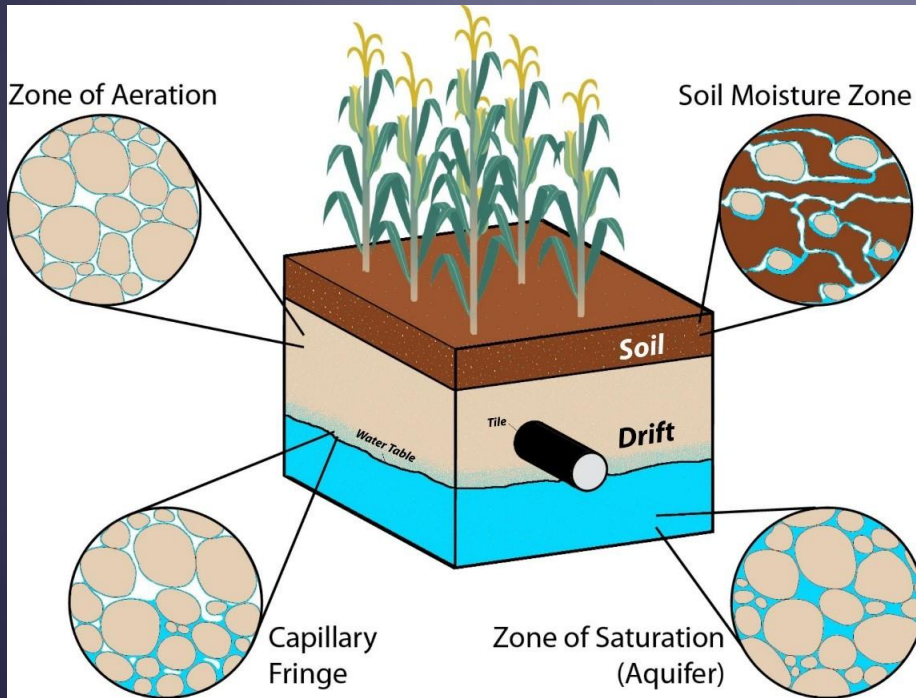


Drain Tiles and Groundwater Resources: Understanding the Relations



Drain Tiles and Groundwater Resources: Understanding the Relations

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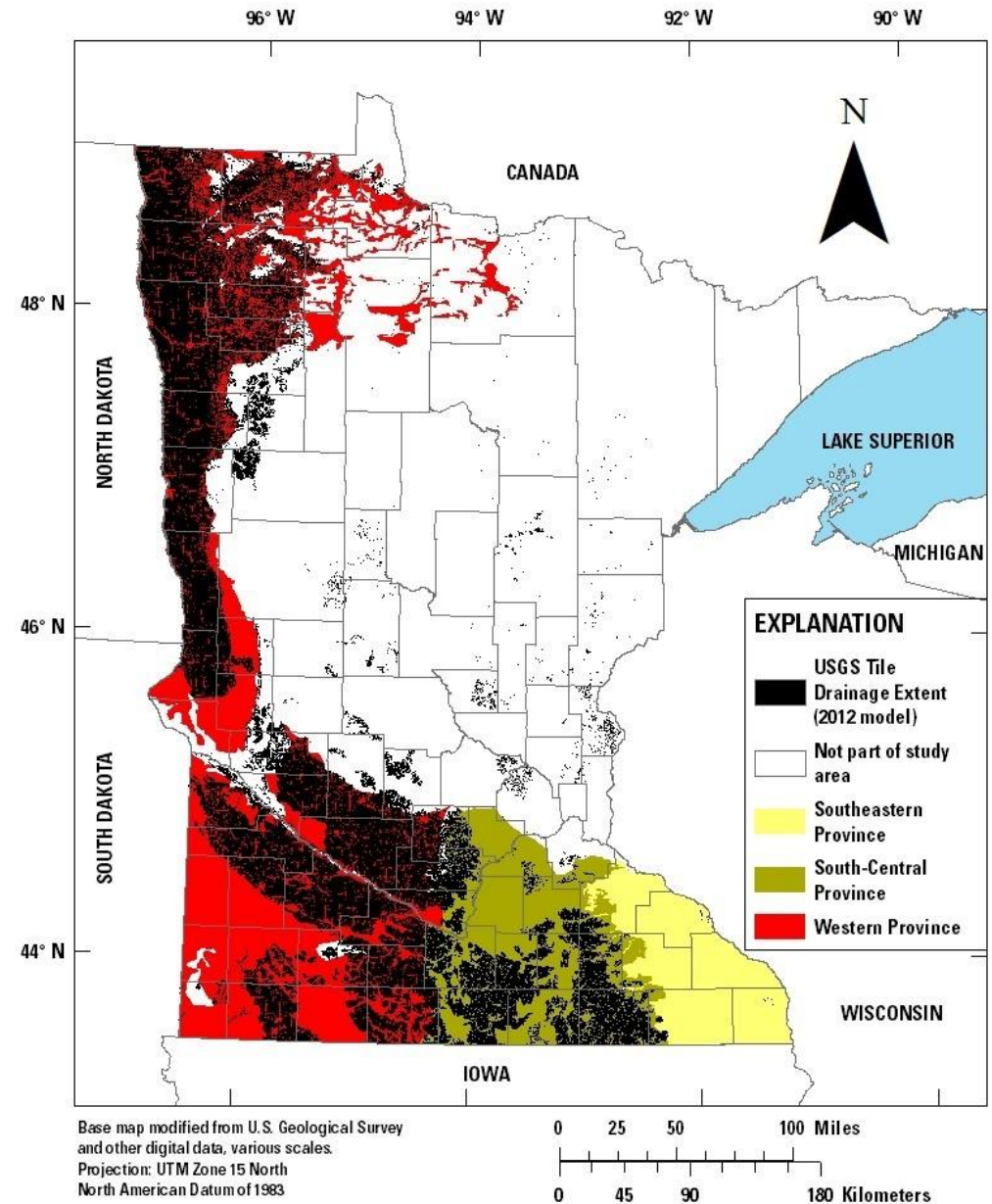


Drain Tiles and Groundwater Resources: Understanding the Relations

- **Good background on:**
 - Drainage benefits
 - Environmental concerns
 - Drainage history
 - Groundwater (basic)
 - Agricultural drainage
- **Major messages:**
 - Complex history
 - Drainage provinces: three major regions in Minnesota: southeast, south-central, western
 - Knowledge gaps

Drain Tiles and Groundwater Resources: Understanding the Relations

- Drainage provinces: three major regions
- Not comprehensive, but focused discussion
- Based on USGS tile coverage estimates and groundwater provinces



Drain Tiles and Groundwater Resources: Understanding the Relations

Knowledge Gaps and Research Opportunities:

- Drainage is extensive – specifically where is not well known
- Hard to separate the causes
- Lack of knowledge on infiltration rates below drainage
- Changes in ET and runoff
- **Recharge effects unknown**

Research Opportunities:

- Baseline modeling
- Long-term studies: groundwater recharge effects
- Remote sensing techniques: estimate tiling extent

