

# Climate Change Adaptation in the Managed Canadian Boreal Forest

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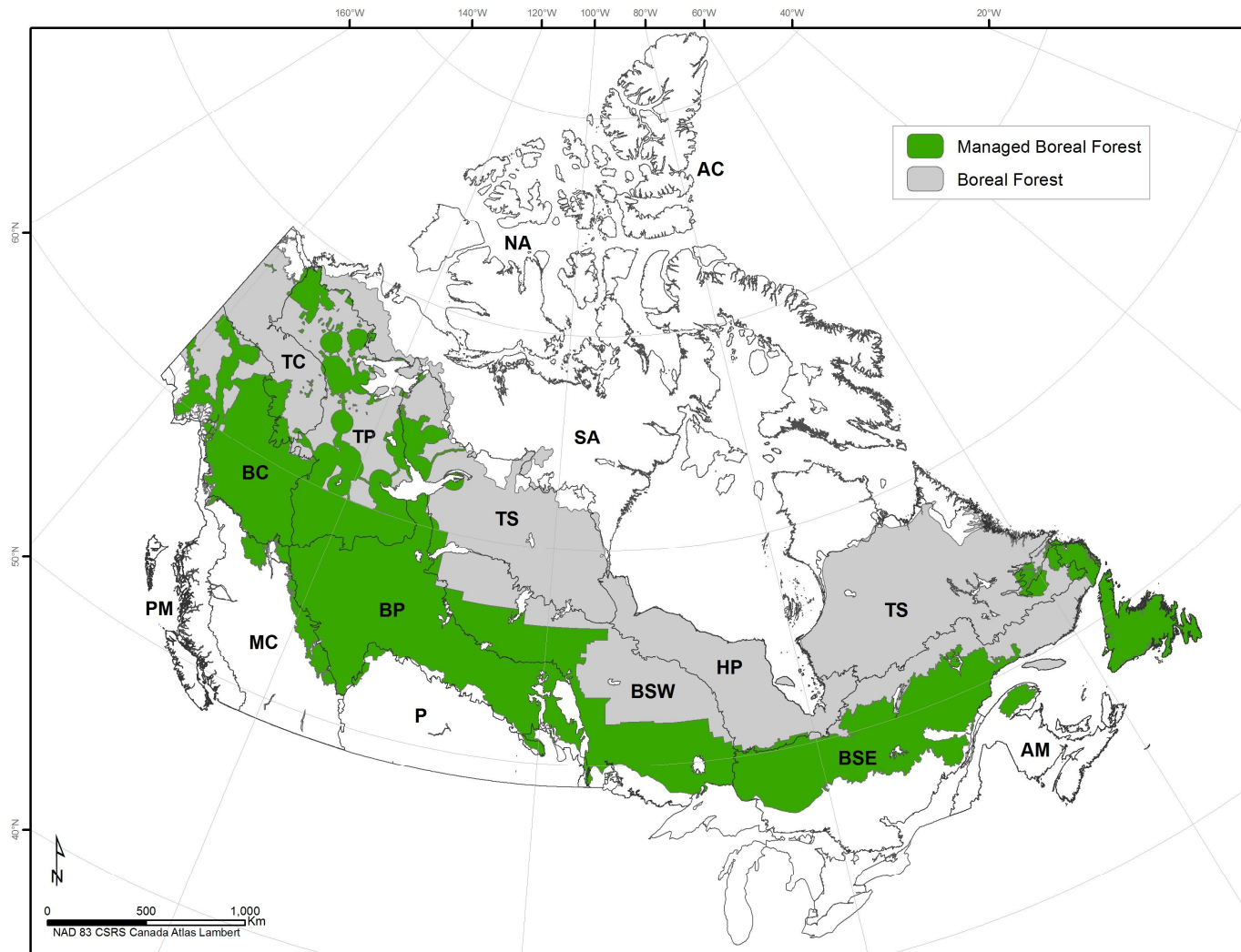
Ressources naturelles  
Canada

Natural Resources  
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Canada 

# Canada's managed boreal forest

(adapted from Stinson et al. 2011 and Brandt 2009)

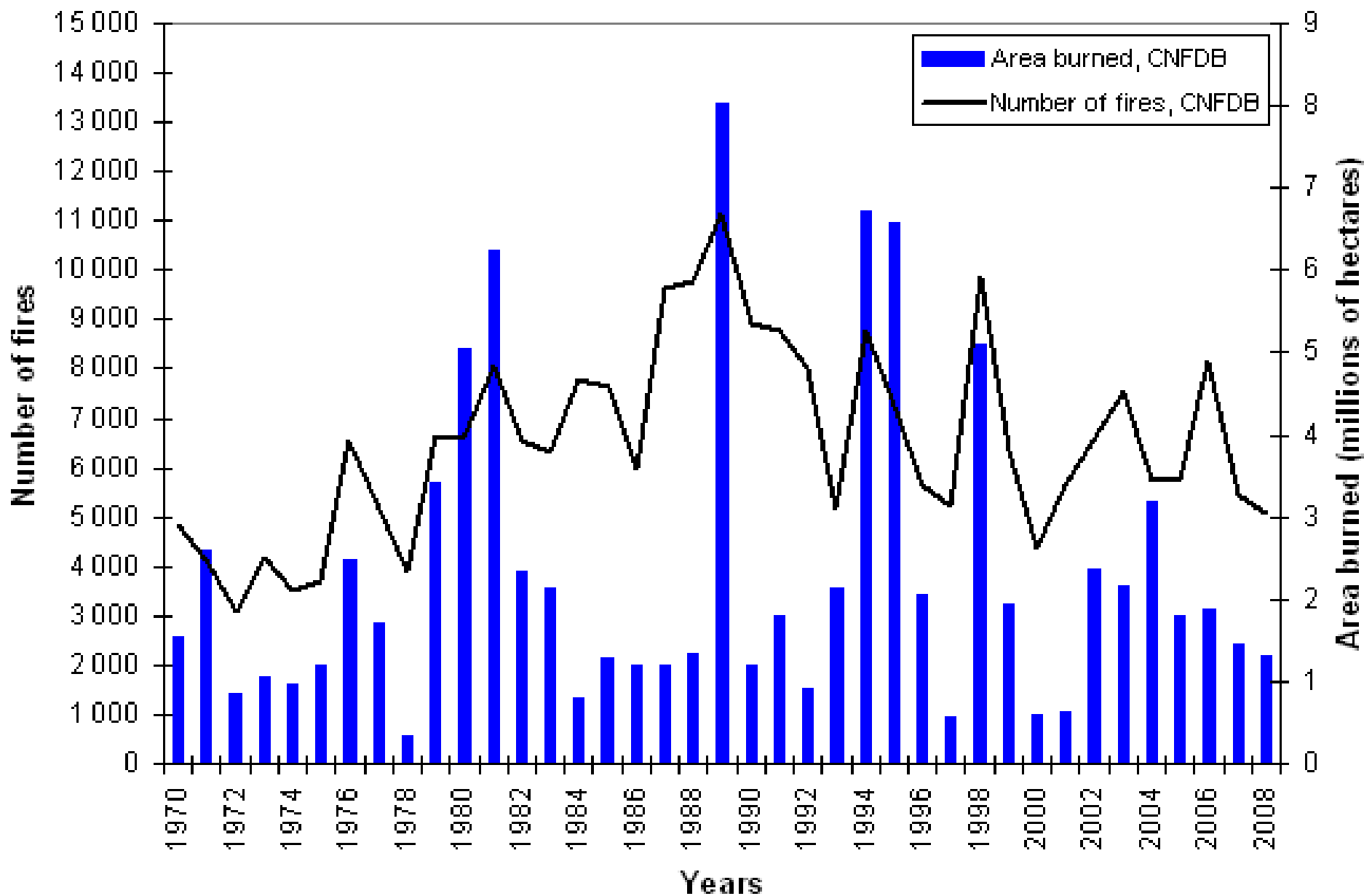


Natural disturbances  
are the main drivers  
of forest dynamics in  
the boreal forest of  
Canada

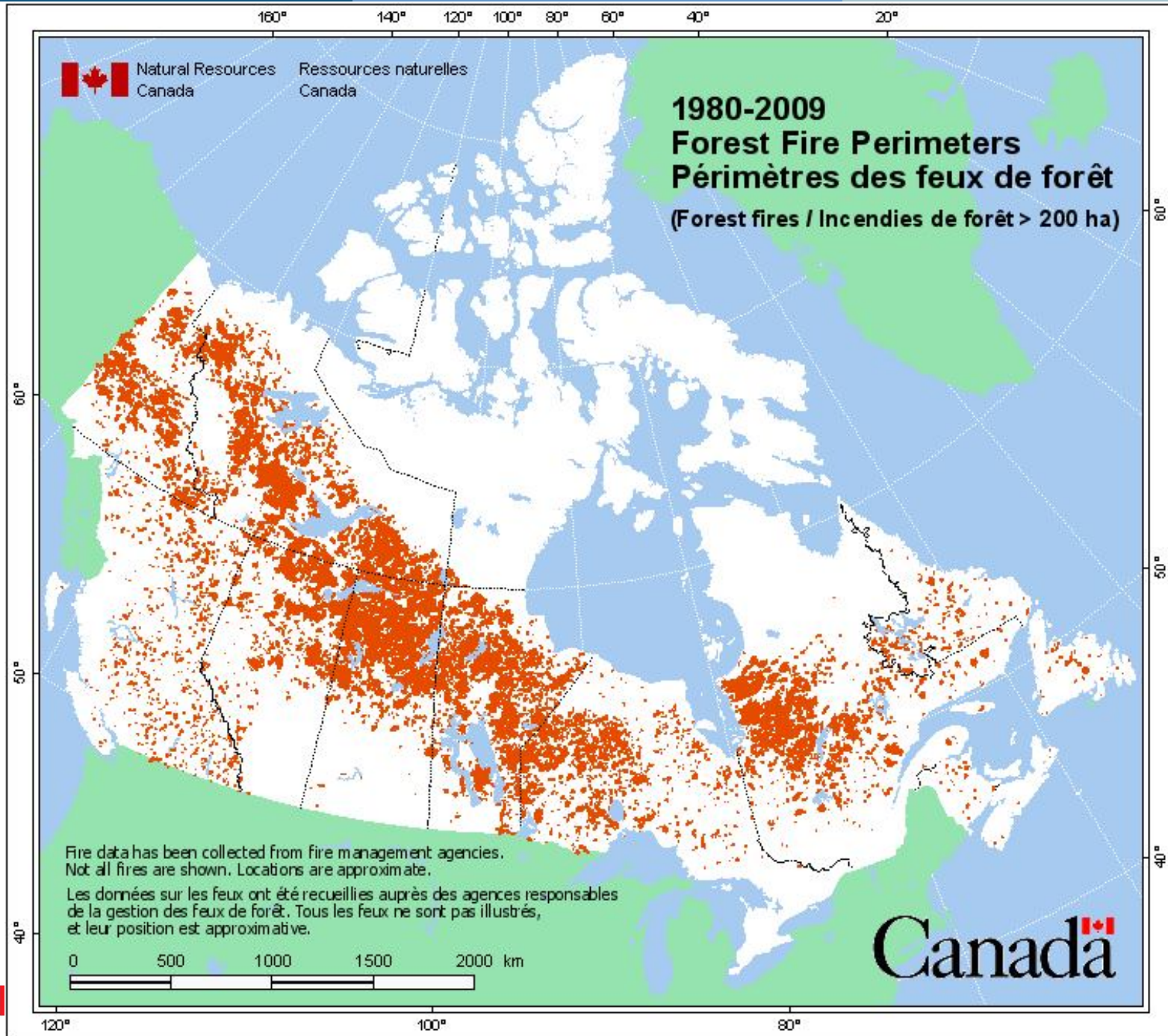


# Number of Fires and Area Burned in Canada by Year

Source: Canadian National Fire Database (CNFDB)

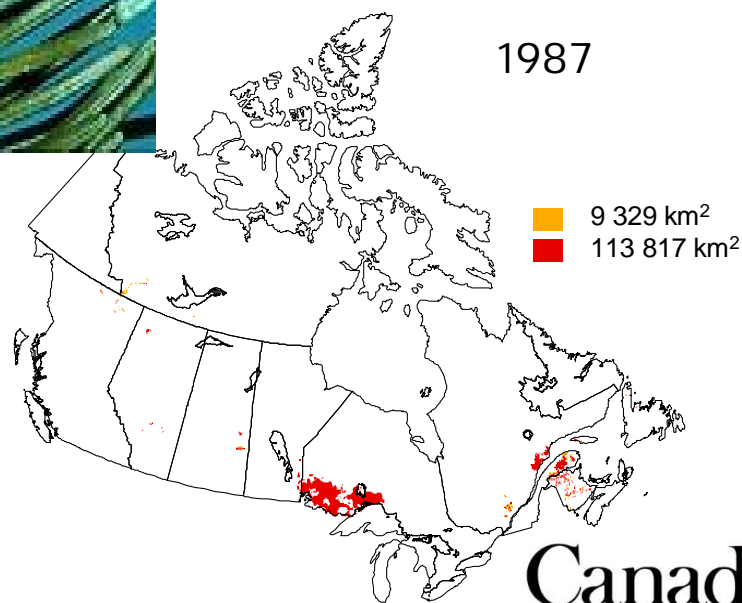
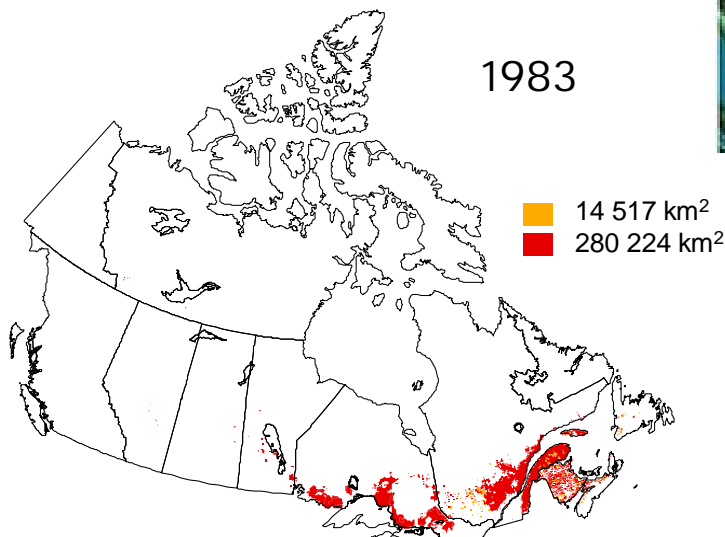
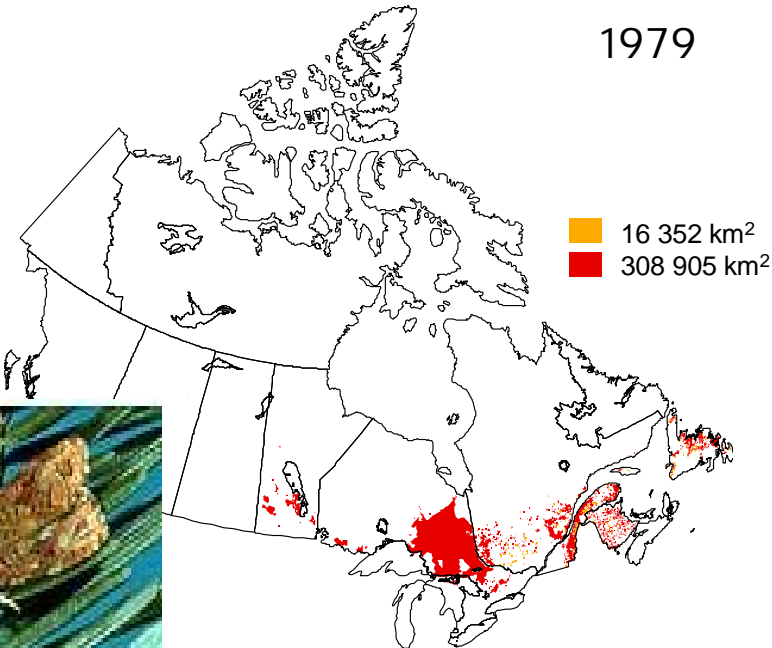
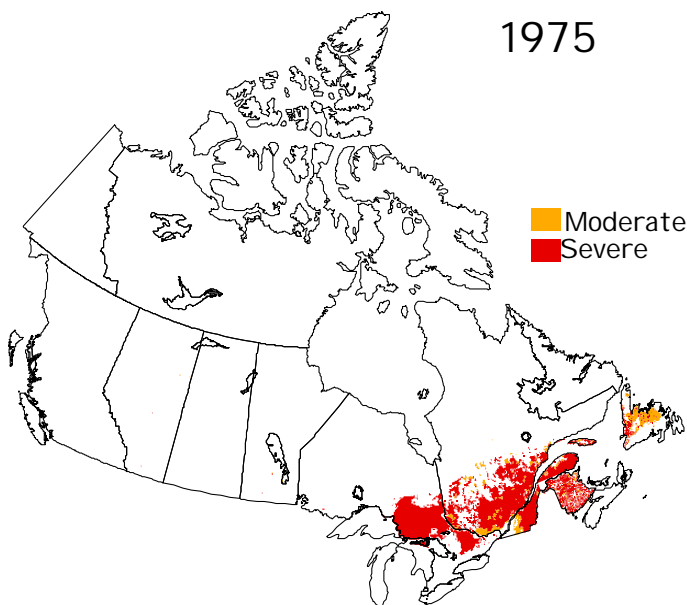






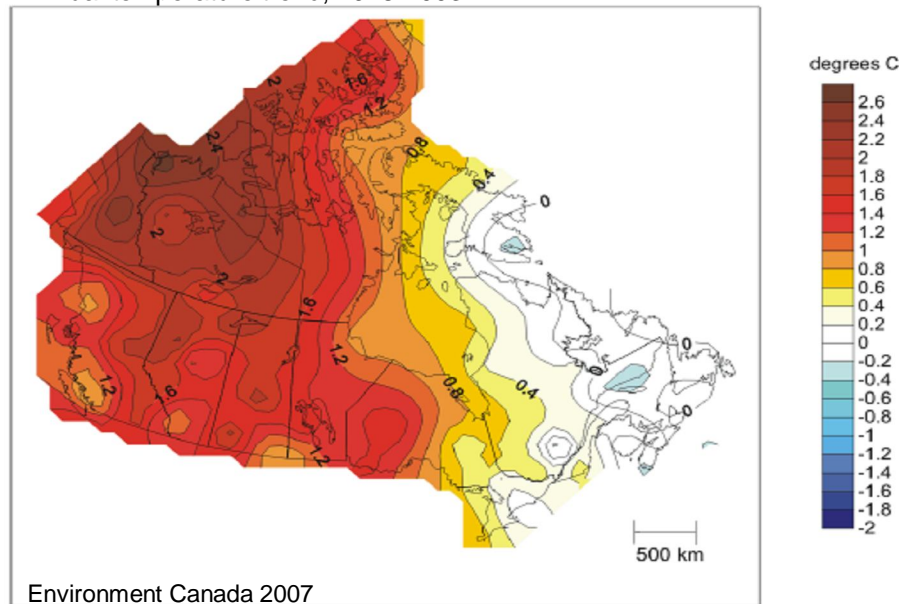
# Spruce Budworm Defoliation

(David Gray and Wayne MacKinnon, Canadian Forest Service)



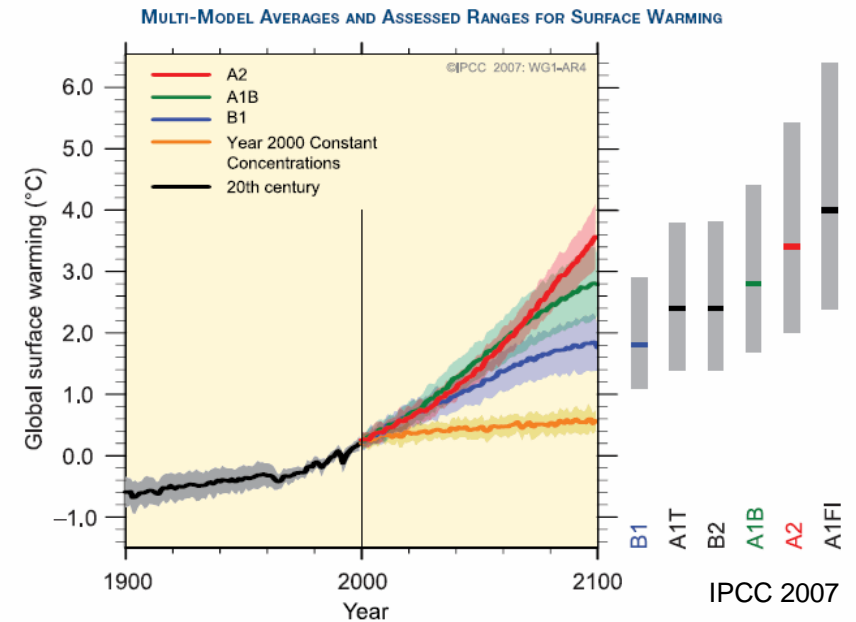
# Climate change: Current trends and predictions

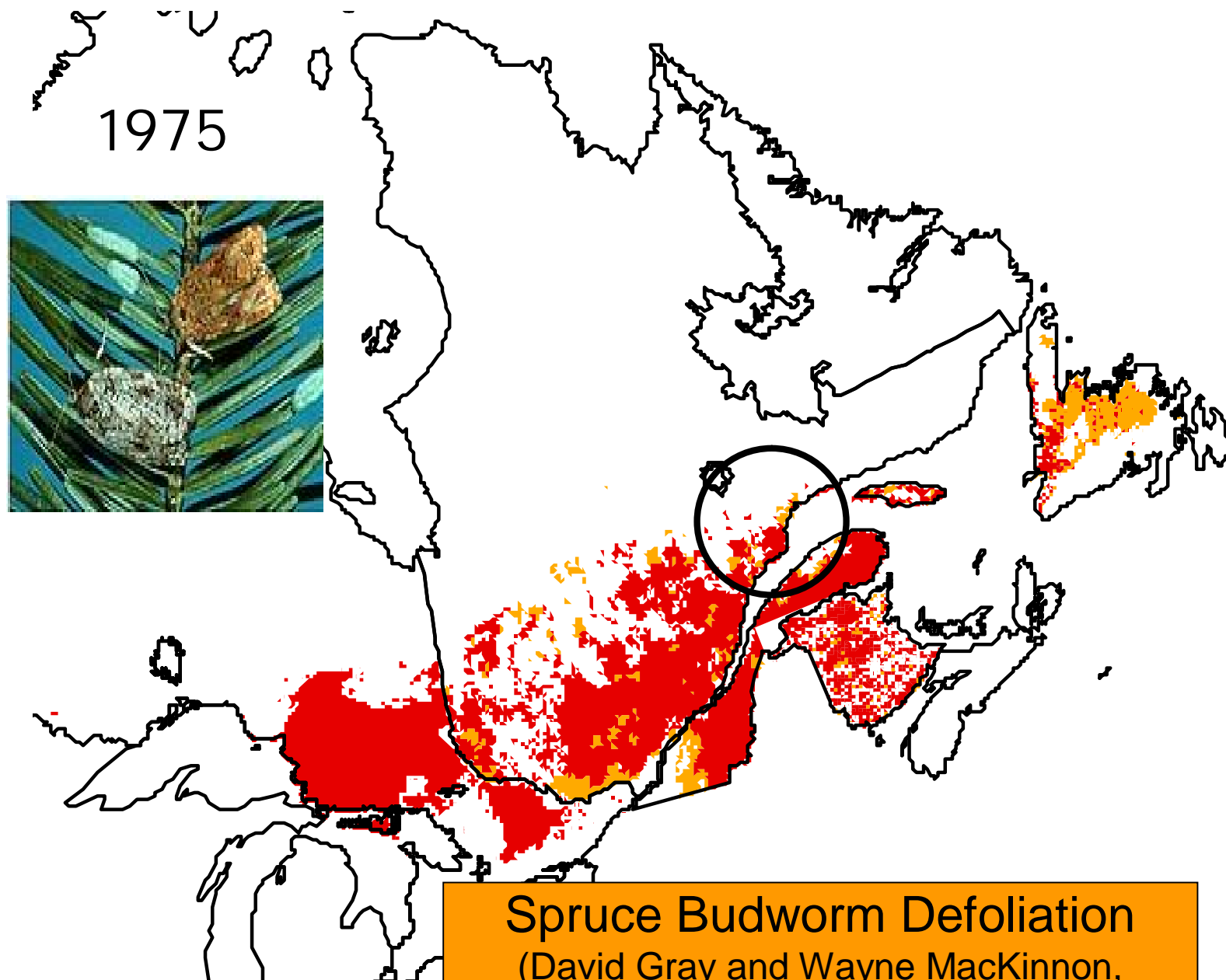
Annual temperature trend, 1948-2003



Canada's forests are getting warmer.

Global predictions call for significant additional warming.

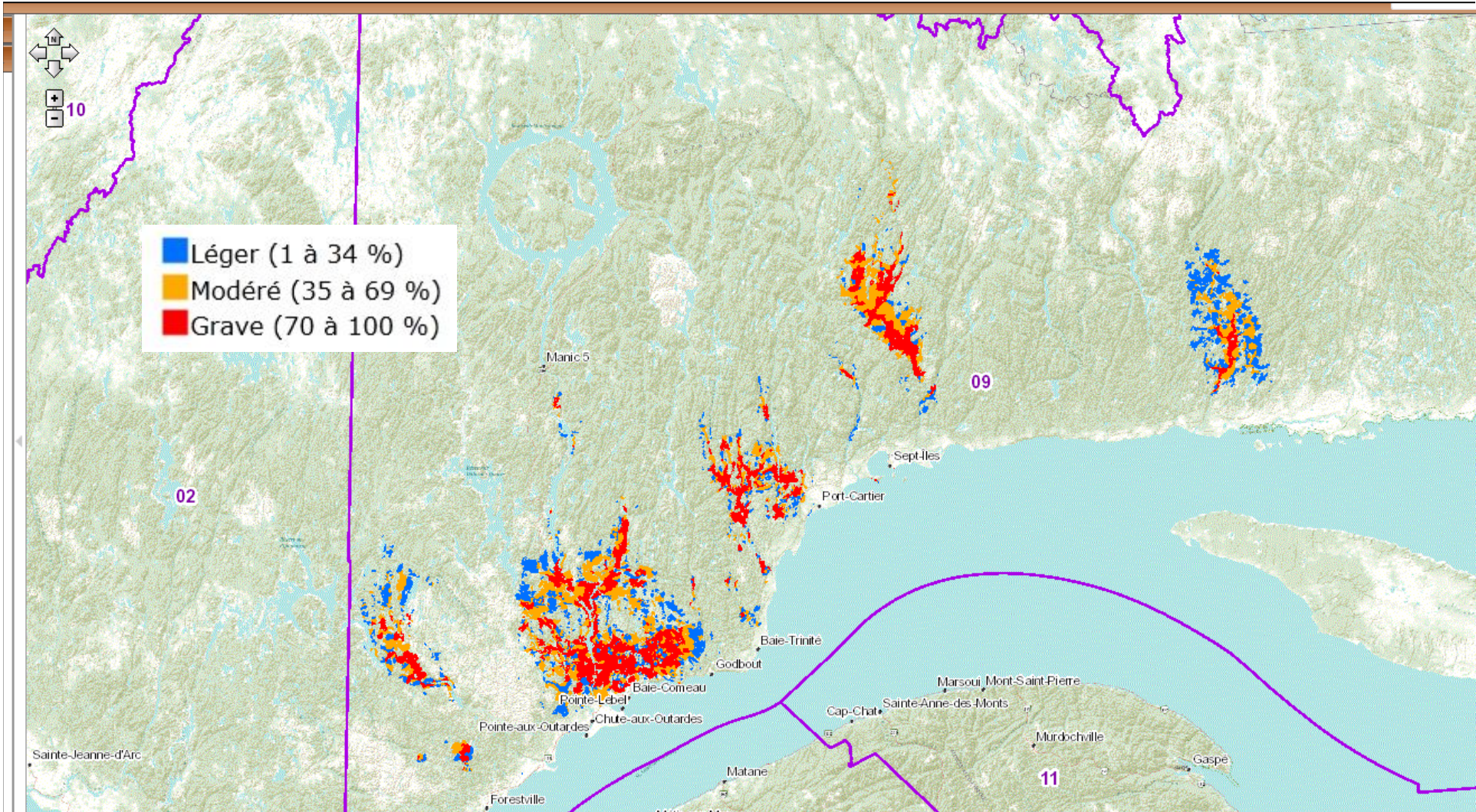




**Spruce Budworm Defoliation**  
(David Gray and Wayne MacKinnon,  
Canadian Forest Service)



# Spruce budworm outbreak in expanded range

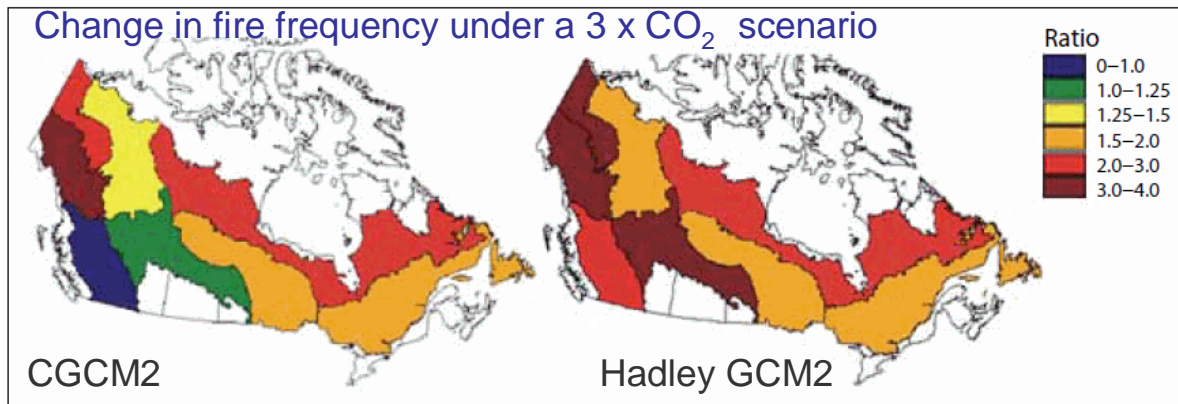
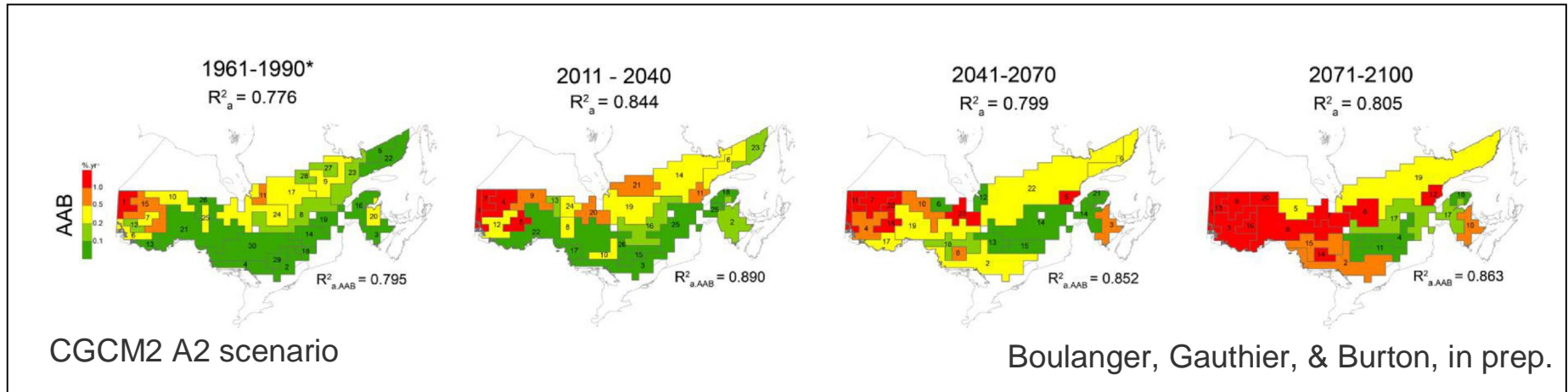


2012 data from the Québec Forest Insect and Disease Protection Agency  
Ressources naturelles Canada / Natural Resources Canada





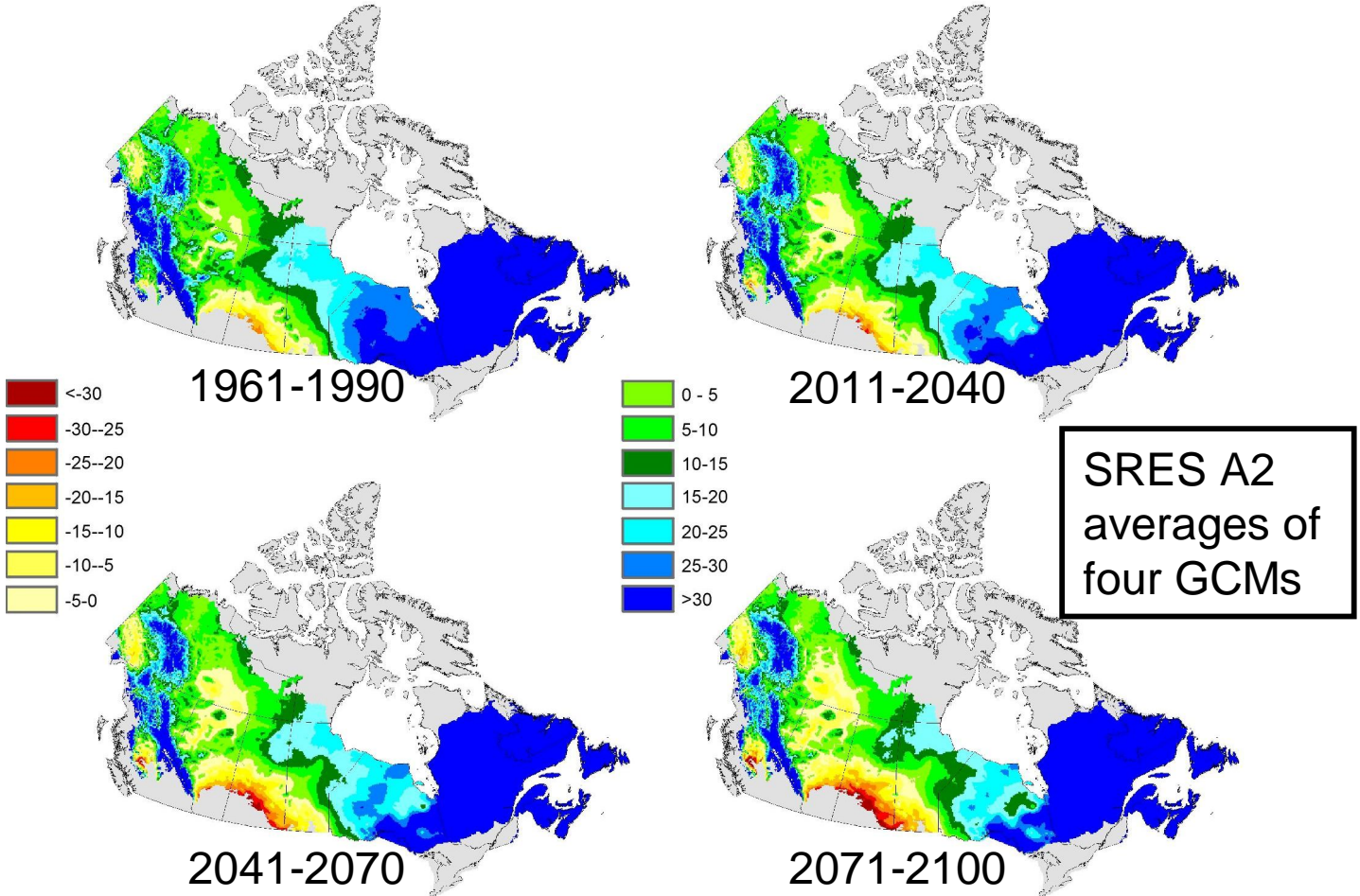
# Projected changes in fire regime



More fires,  
more often



# Projected Drought (Climate Moisture Index)



Canada

Canada

Hogg et al, Maps prepared by Y. Wang, NRCan,

# Forest fires: an issue of health and safety in boreal forest communities



Slave Lake, Alberta, 2011





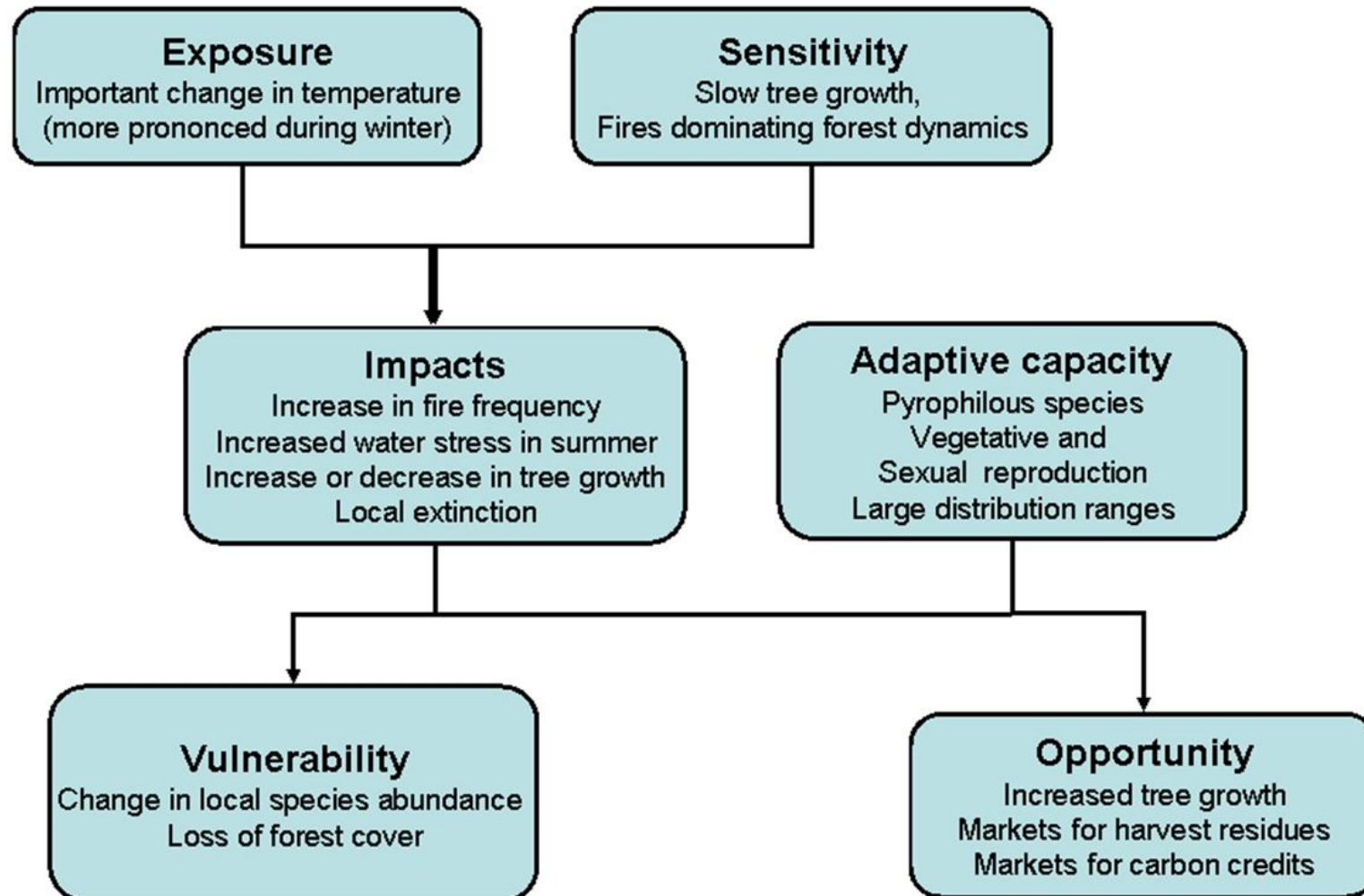
## Climate change impacts on forest management



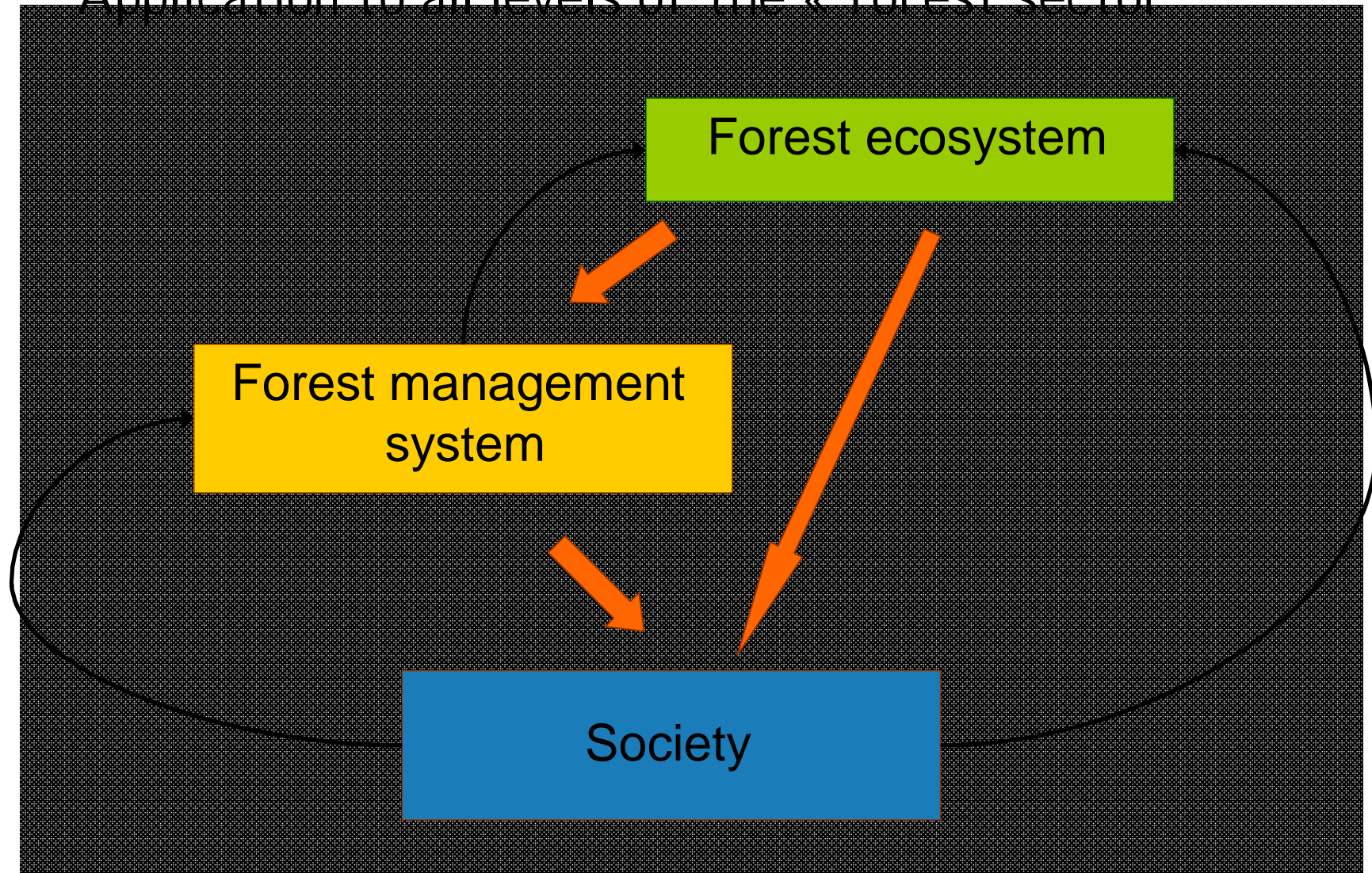
- Shorter winter harvesting/road periods
- Increased fire-related forest closures
- Safety of personnel
- Type and availability of timber supply
- Long term sustainability goals
- Extreme event management
- ...



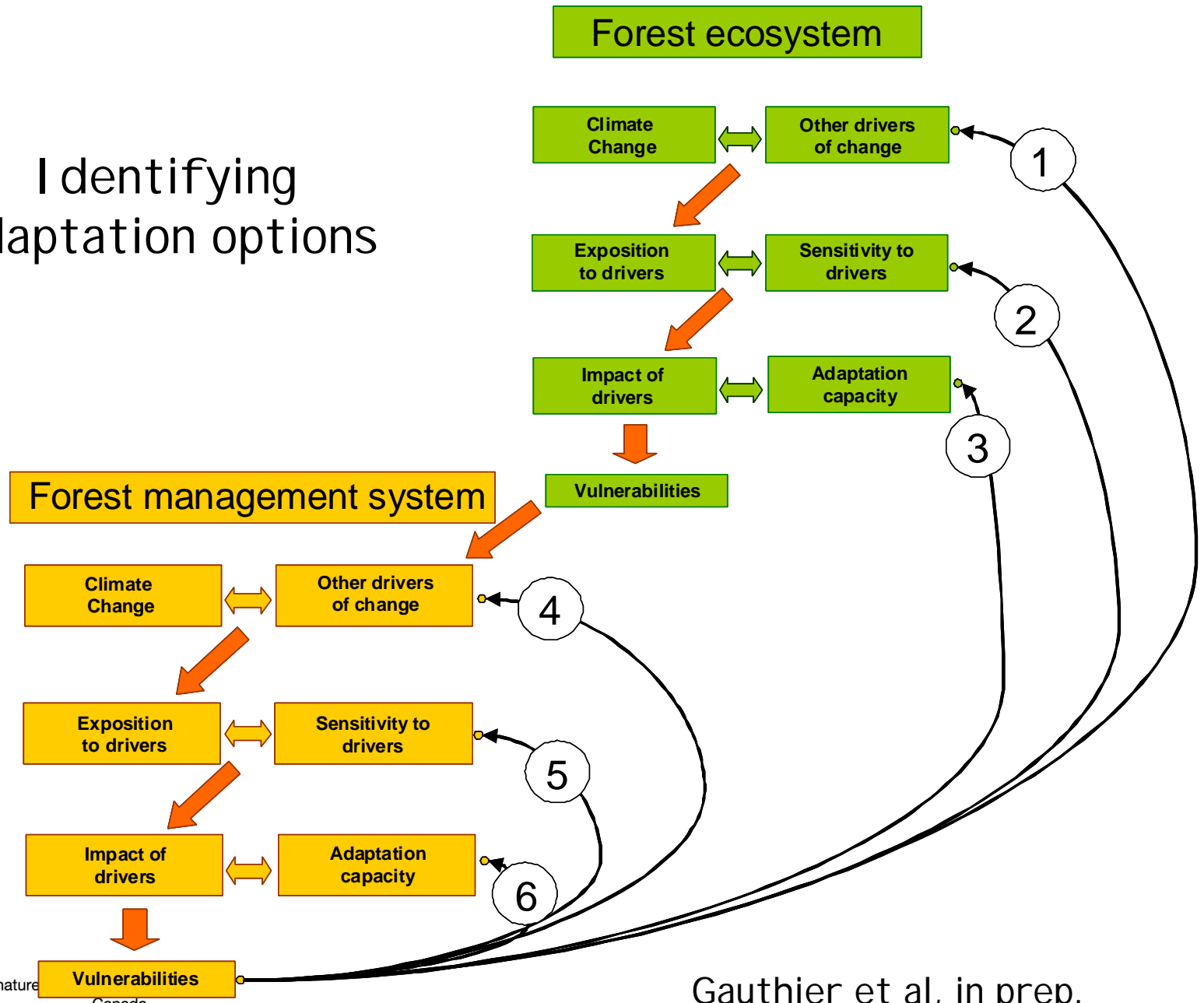
# Vulnerability assessment framework



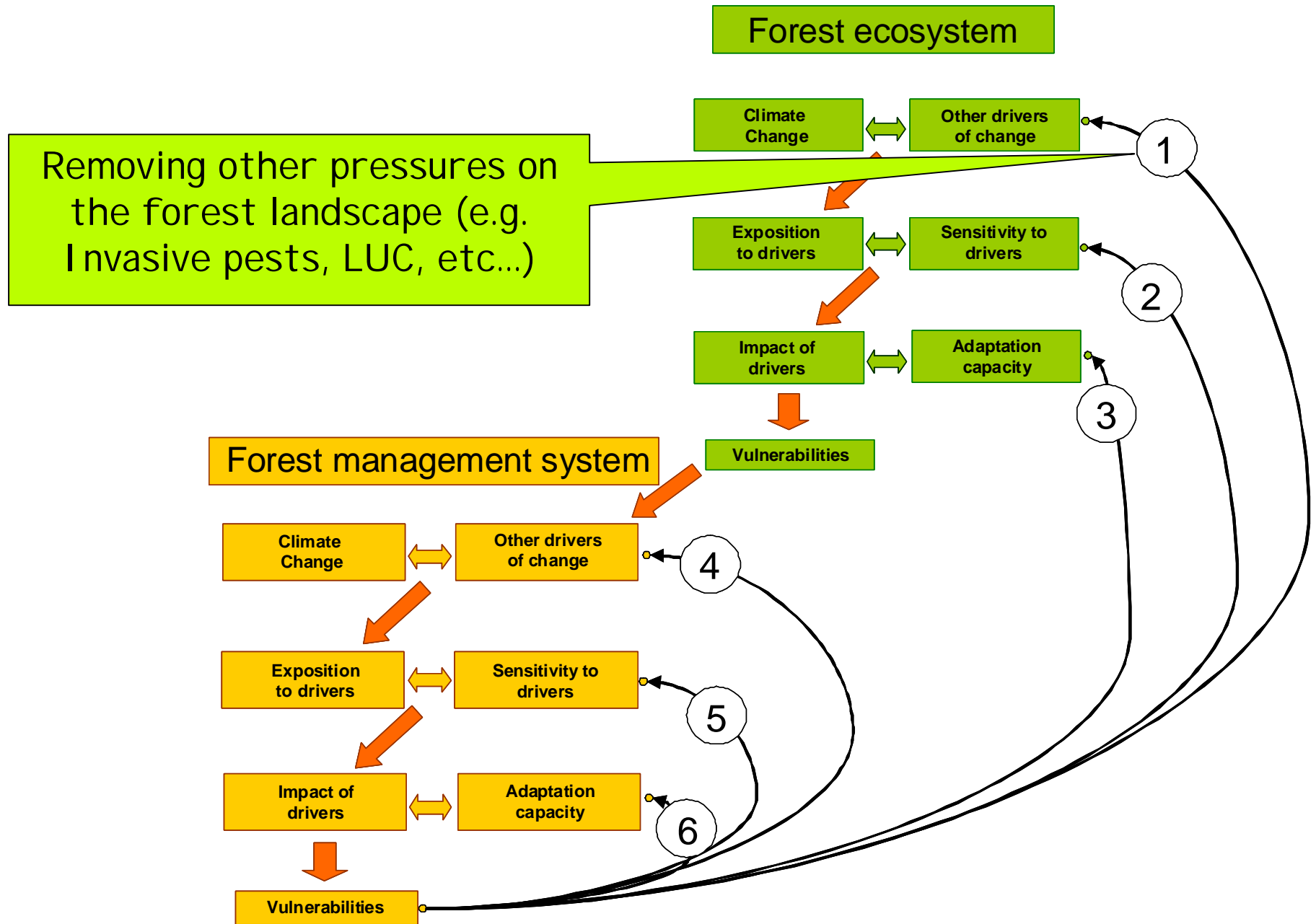
# Vulnerability assessment framework: Application to all levels of the « forest sector »

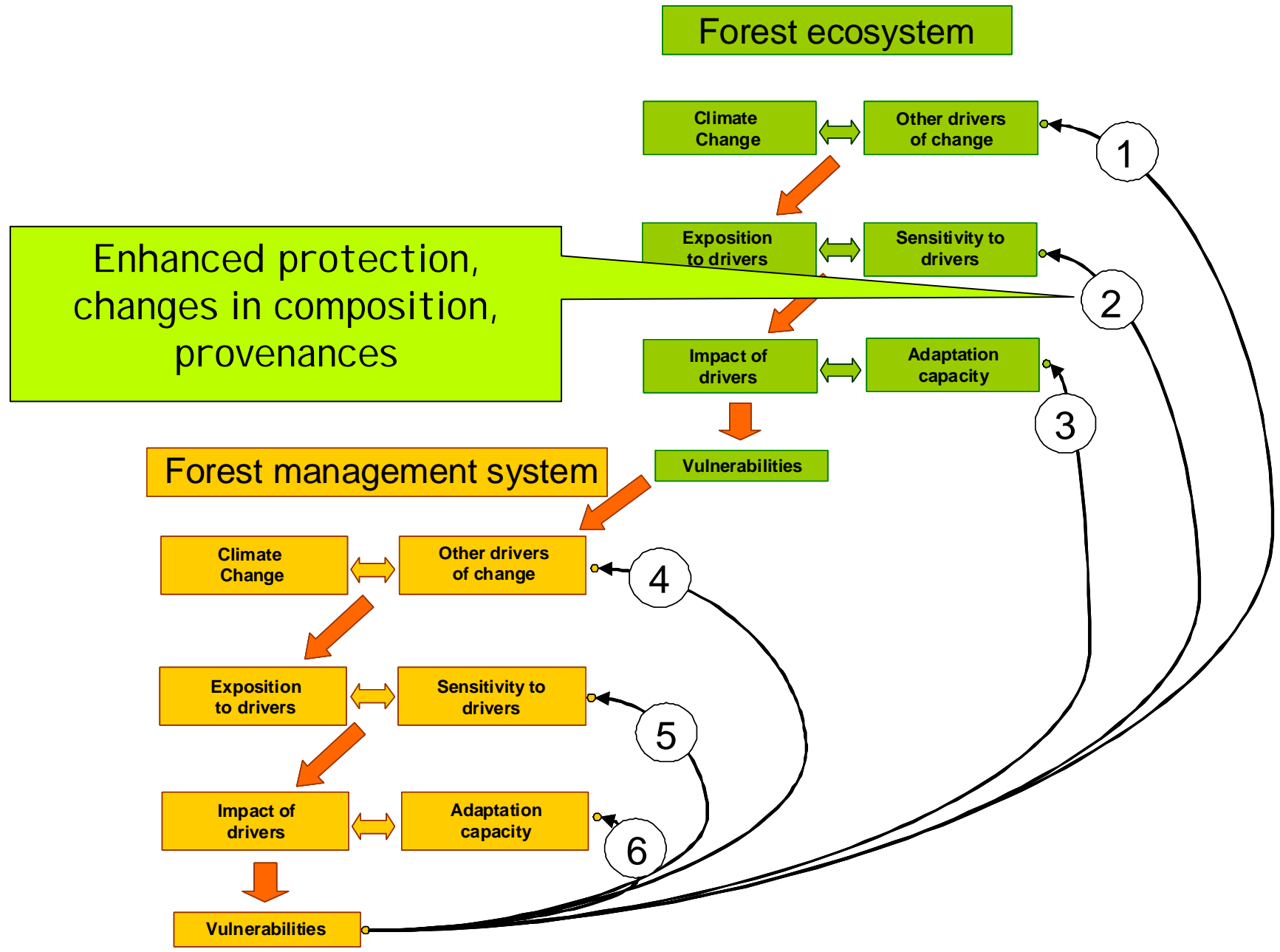


# I identifying adaptation options

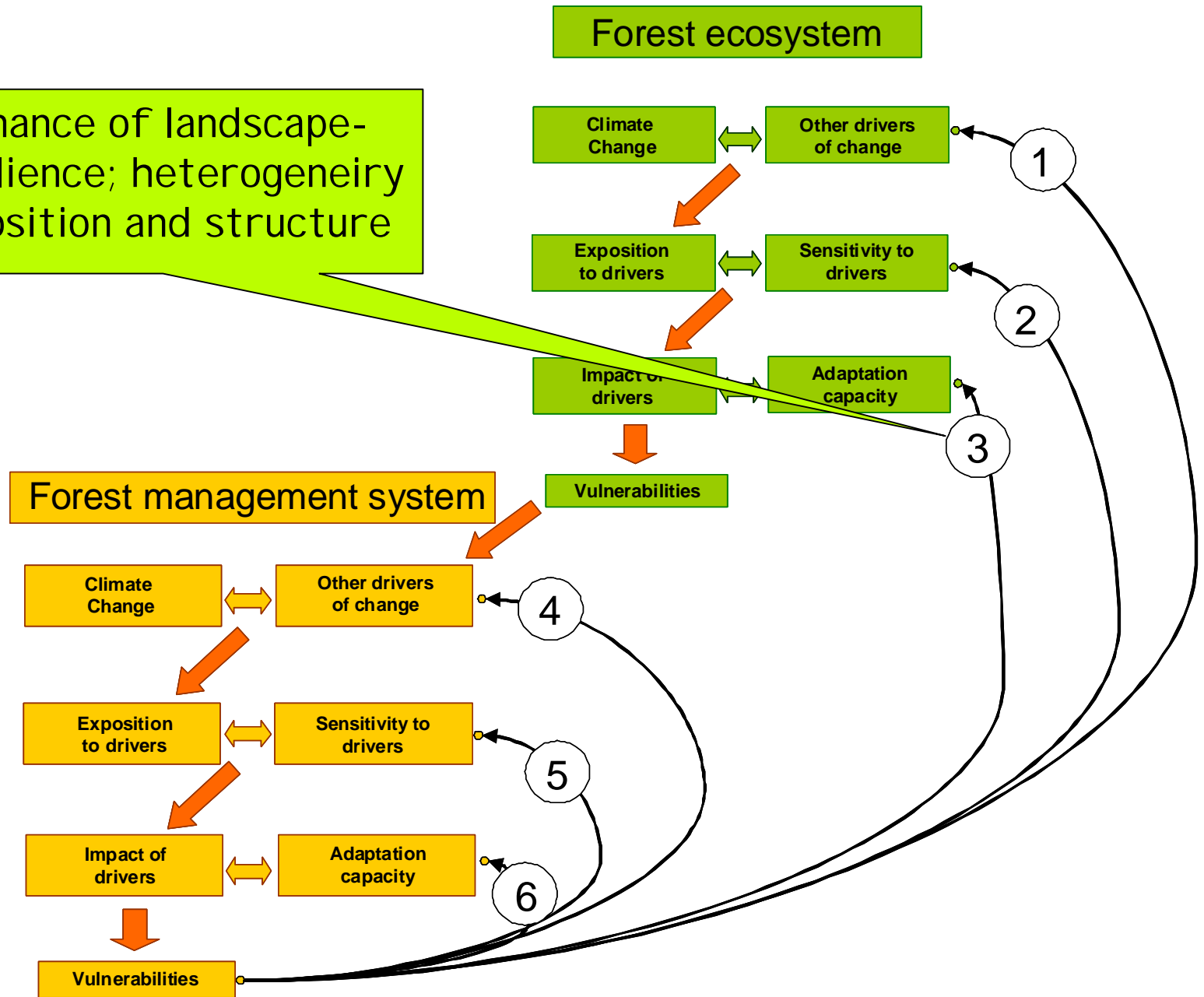




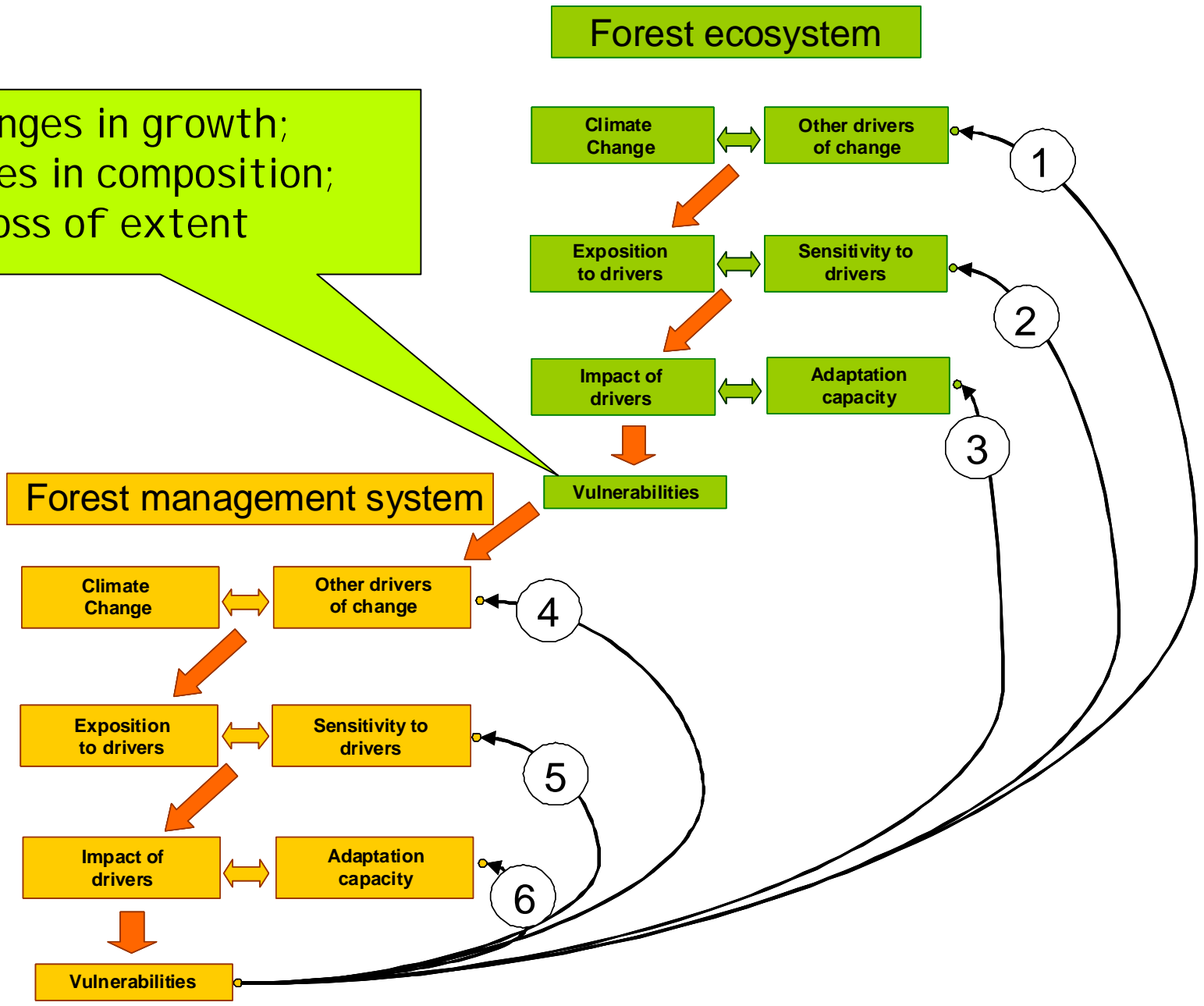




Maintenance of landscape-level resilience; heterogeneity of composition and structure

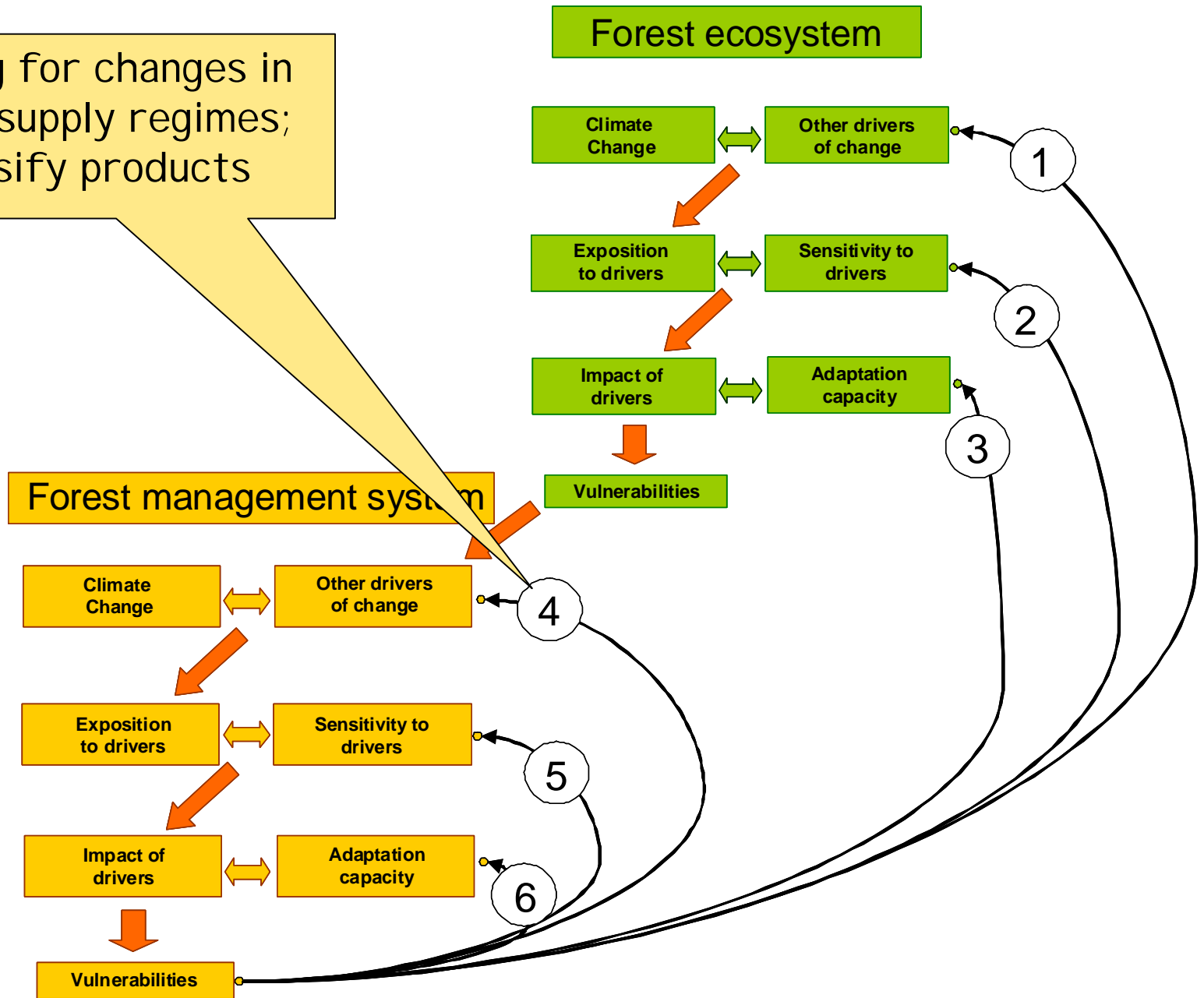


Changes in growth;  
Changes in composition;  
Loss of extent

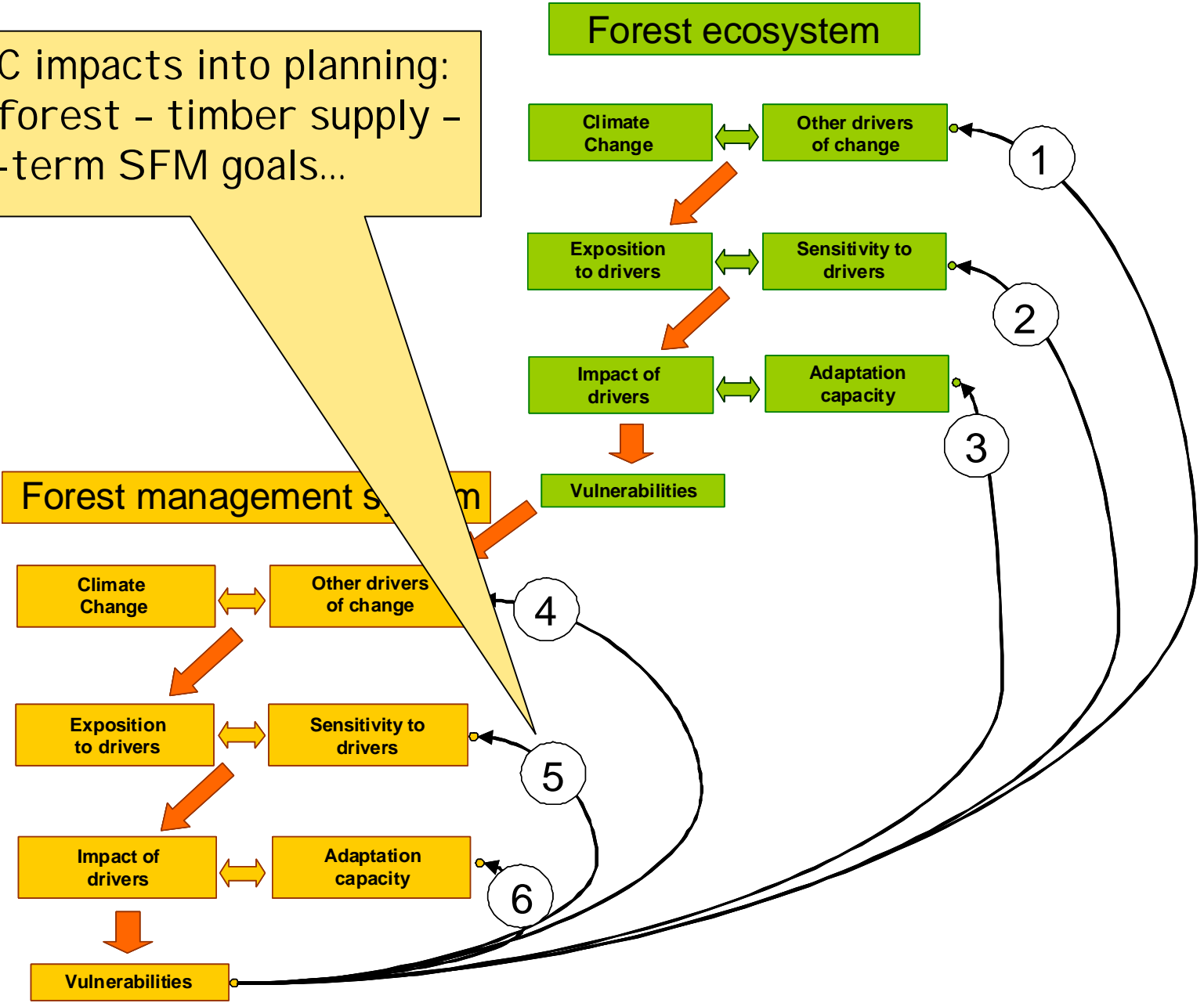




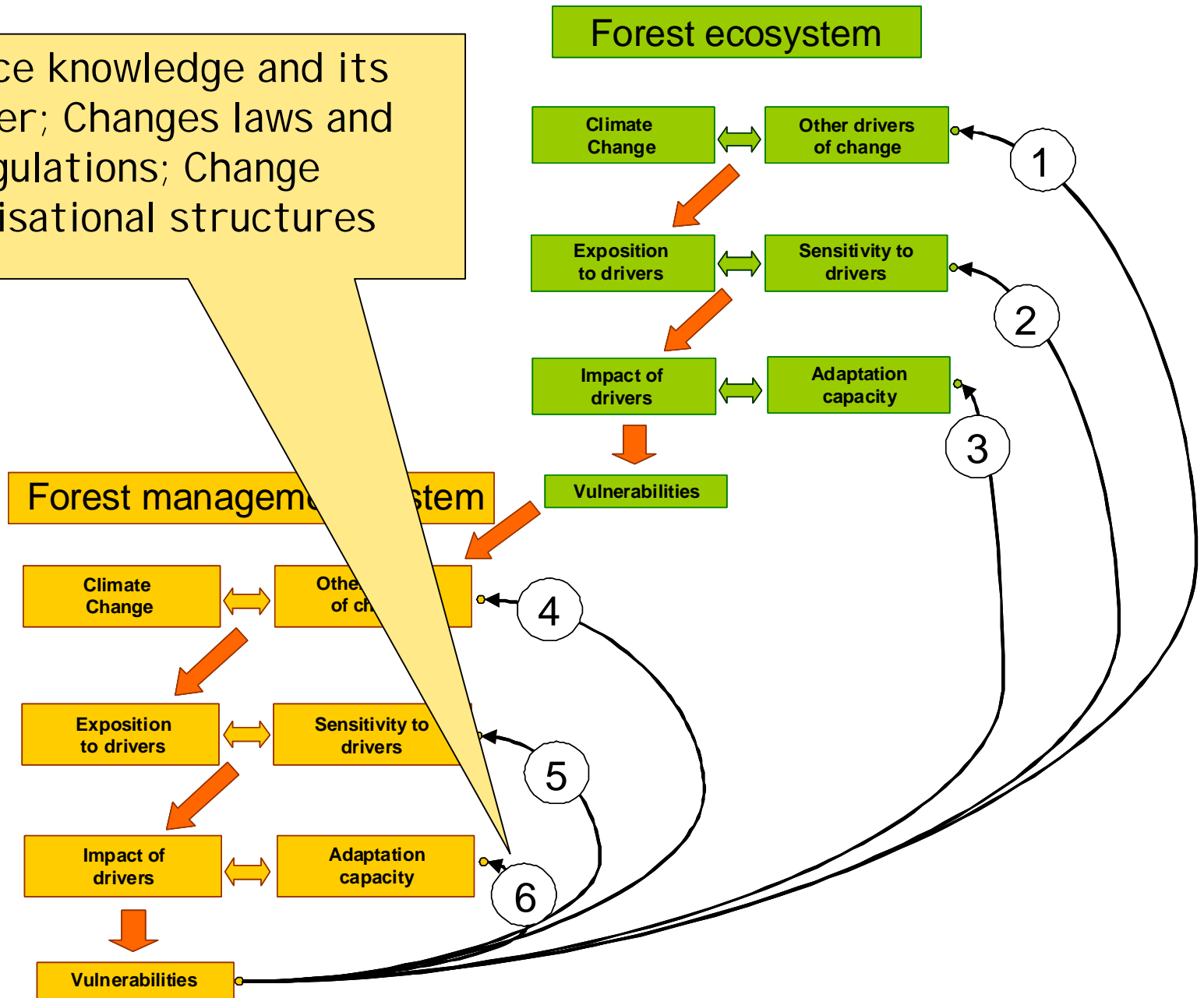
Planning for changes in timber supply regimes; diversify products



Include CC impacts into planning:  
 access to forest - timber supply -  
 long-term SFM goals...



Enhance knowledge and its transfer; Changes laws and regulations; Change organisational structures





## Related presentations:

**Ste-Marie et al:** FOREST CHANGE - Generating, Integrating and Delivering Climate Change Knowledge to Support Forest Sector Adaptation in Canada

**Ste-Marie:** Canada's approach on adaptation







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And many more....