

Round Table Online Event
14/09/2020



SItE - Towards Lecce2021



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www.congresso.ecologia.it

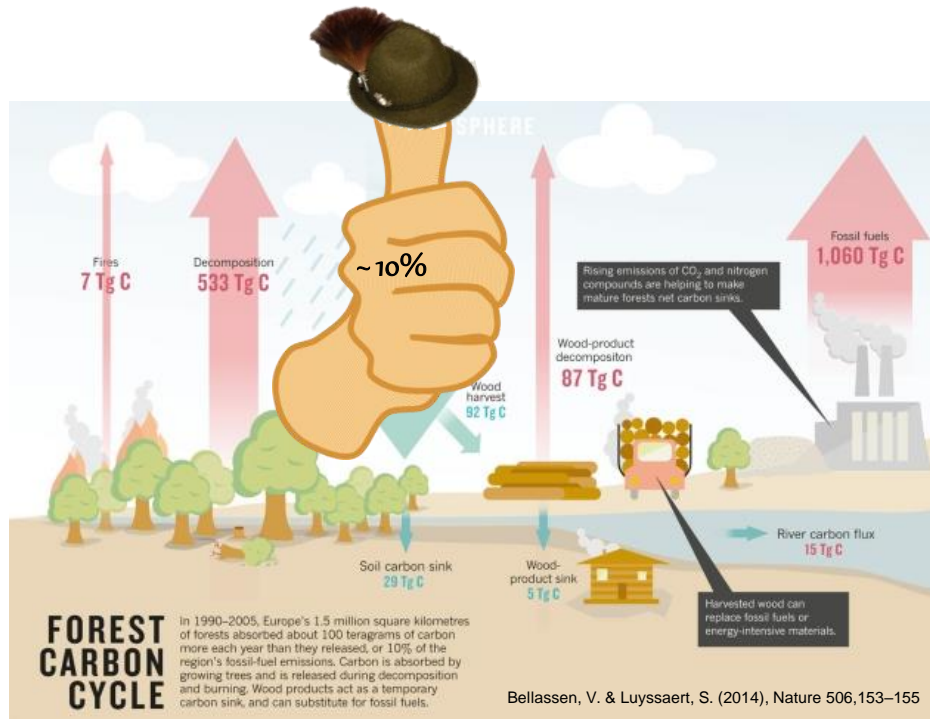
Increased disturbances in mountain forests under climate change

Thomas Dirnböck, Environment Agency Austria

Round Table Session “Arctic and Alpine ecosystems in face of climate change”

ENVIRONMENT
AGENCY AUSTRIA **umweltbundesamt**^U

EUROPE'S FOREST CARBON SINK



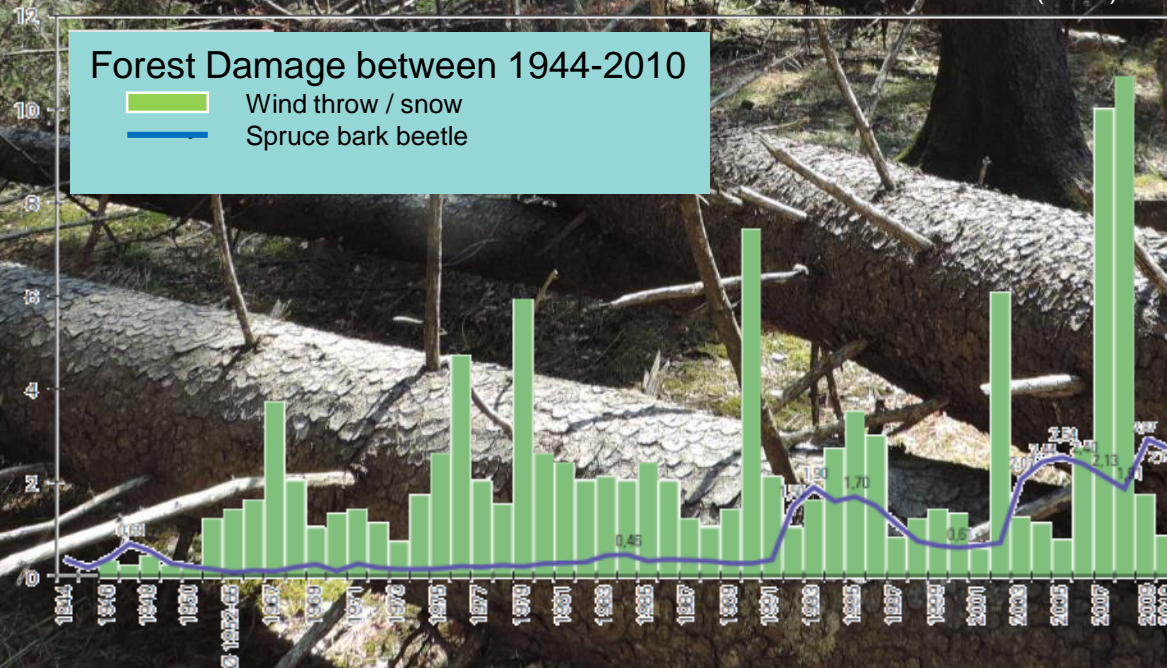
Bellassen, V. & Luyssaert, S. (2014), Nature 506,153–155



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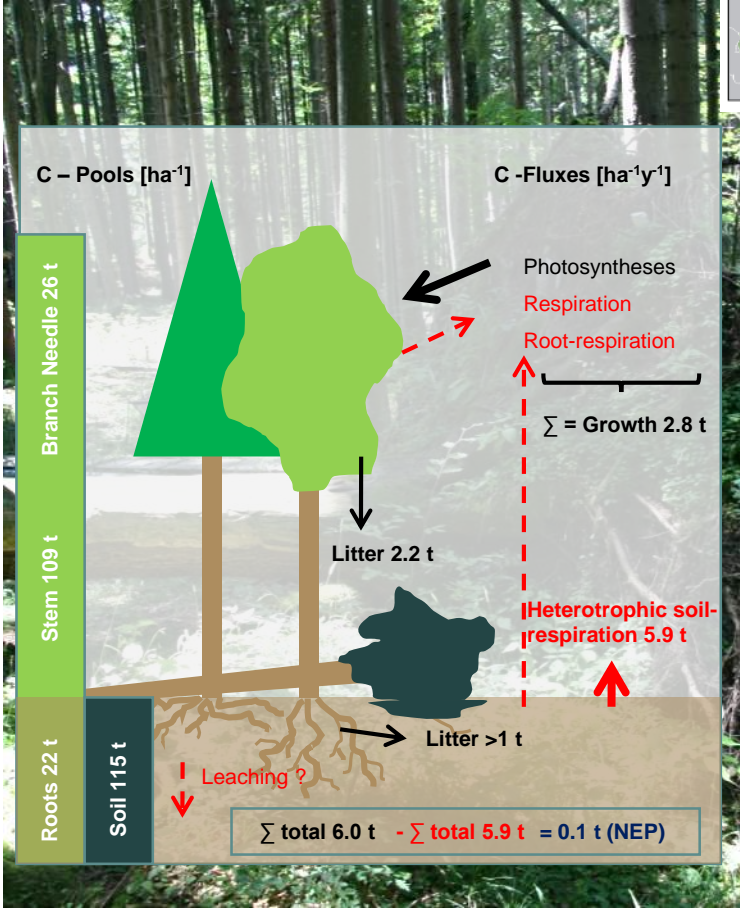
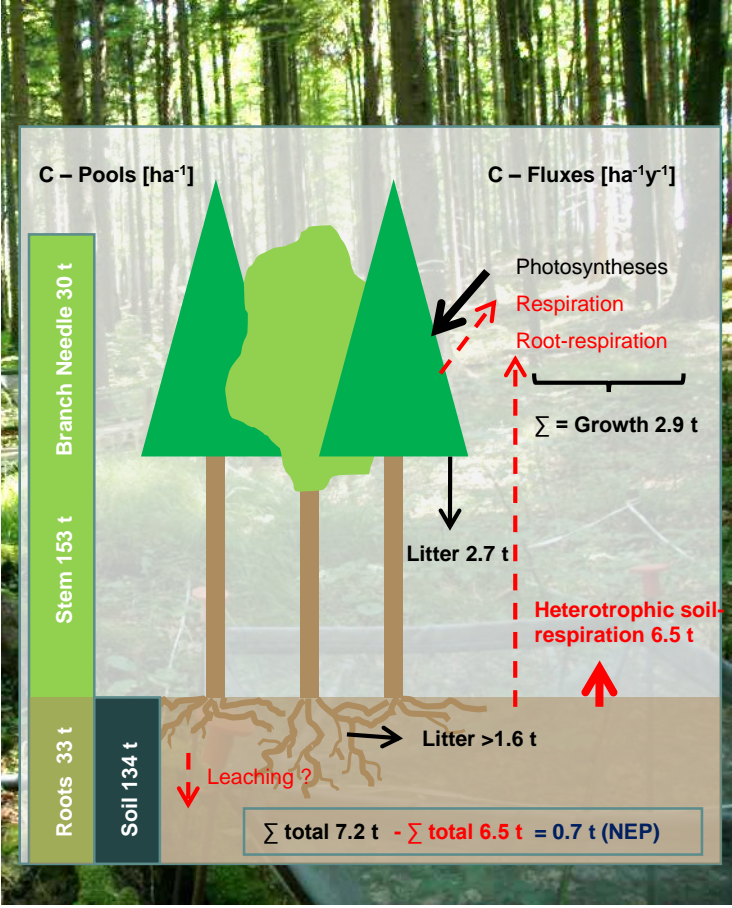
FOREST DISTURBANCES ARE ON THE RISE

Tomiczek et al. (2011)

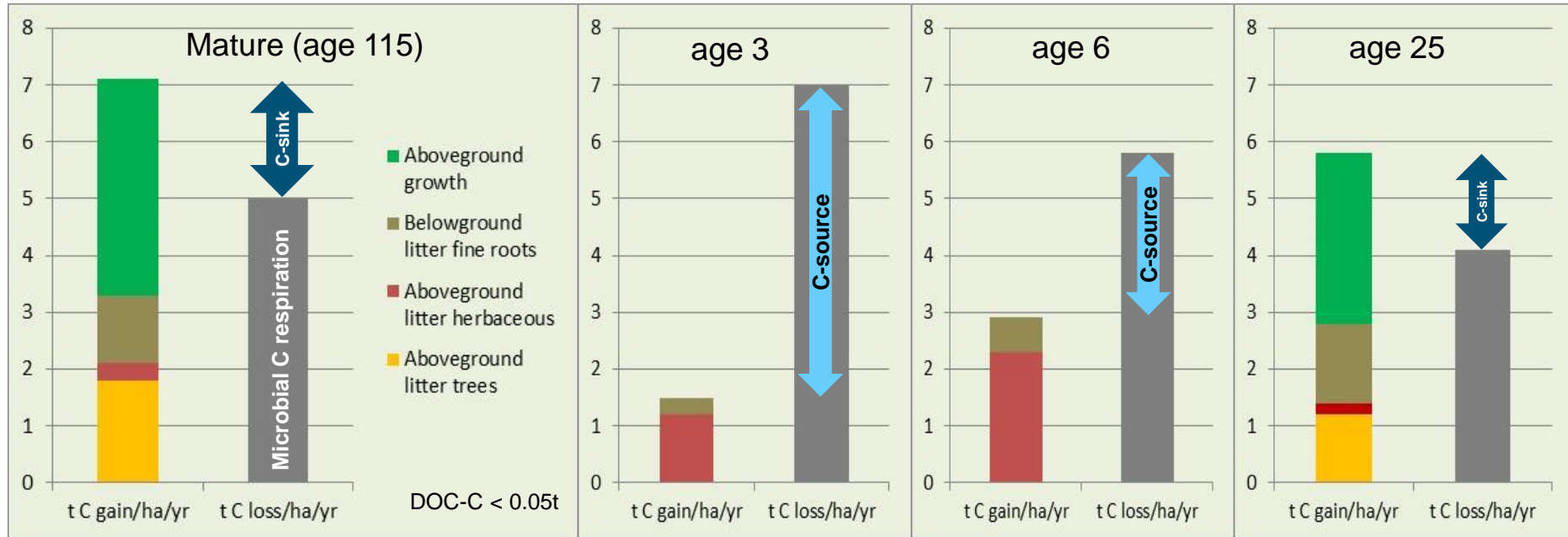




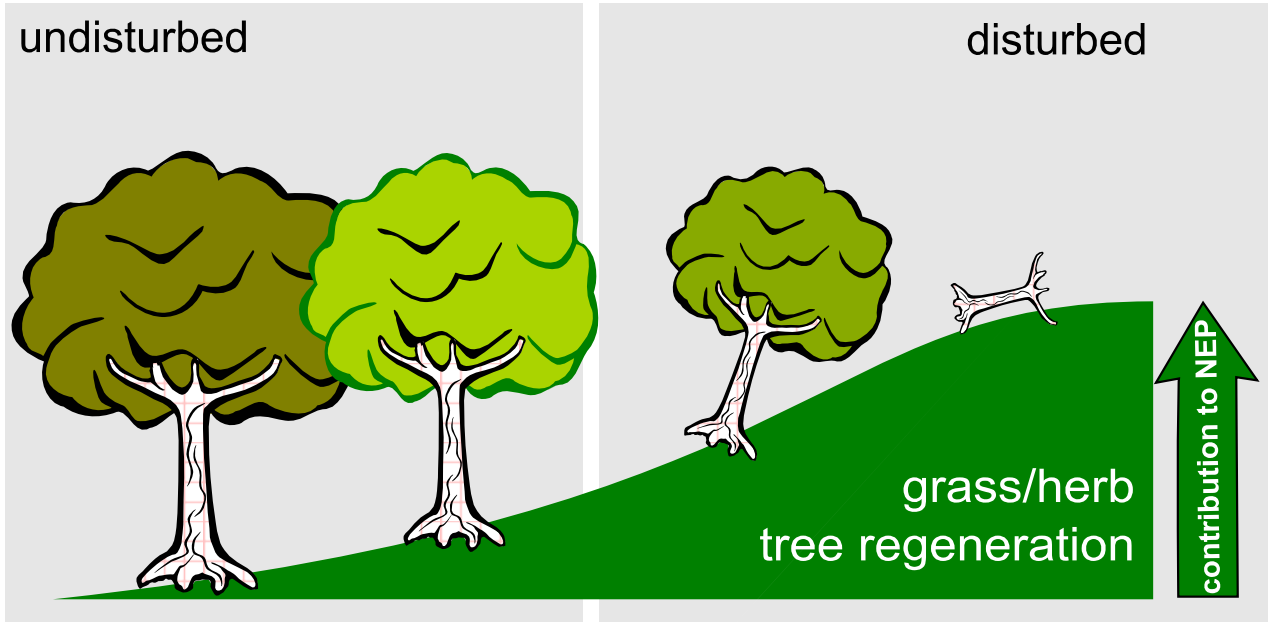
REDUCTION IN CARBON SINK STRENGTH



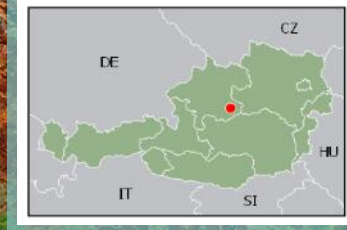
POST-DISTURBANCE EFFECT OF THE HERB LAYER



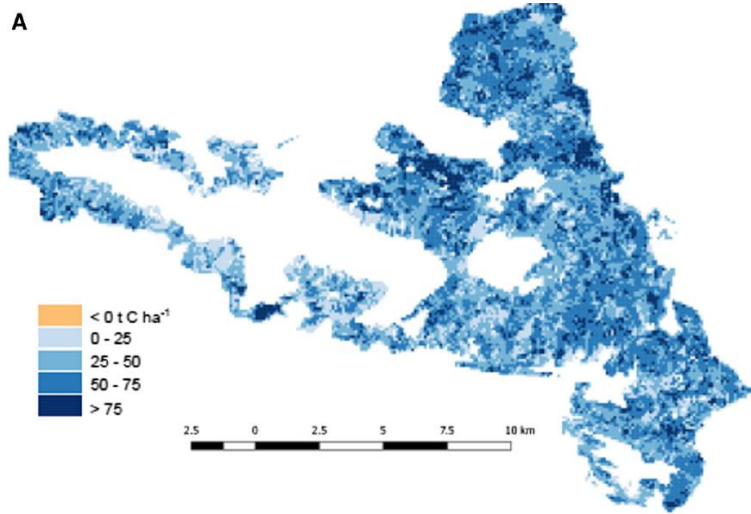
FOREST UNDERSTORY CONTRIBUTES TO MAINTAIN THE C SINK IN DISTURBED FORESTS



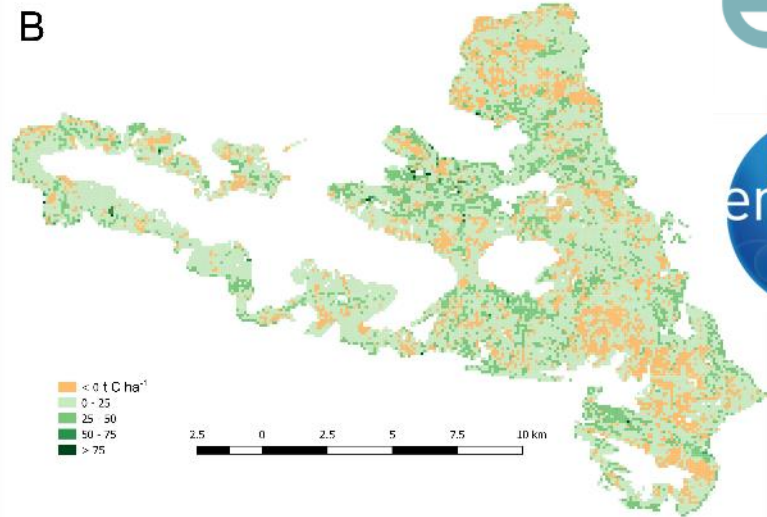
NATIONAL PARK KALKALPEN, AUSTRIA



REGIONAL CARBON SINK IN THE NATIONAL PARK KALKALPEN



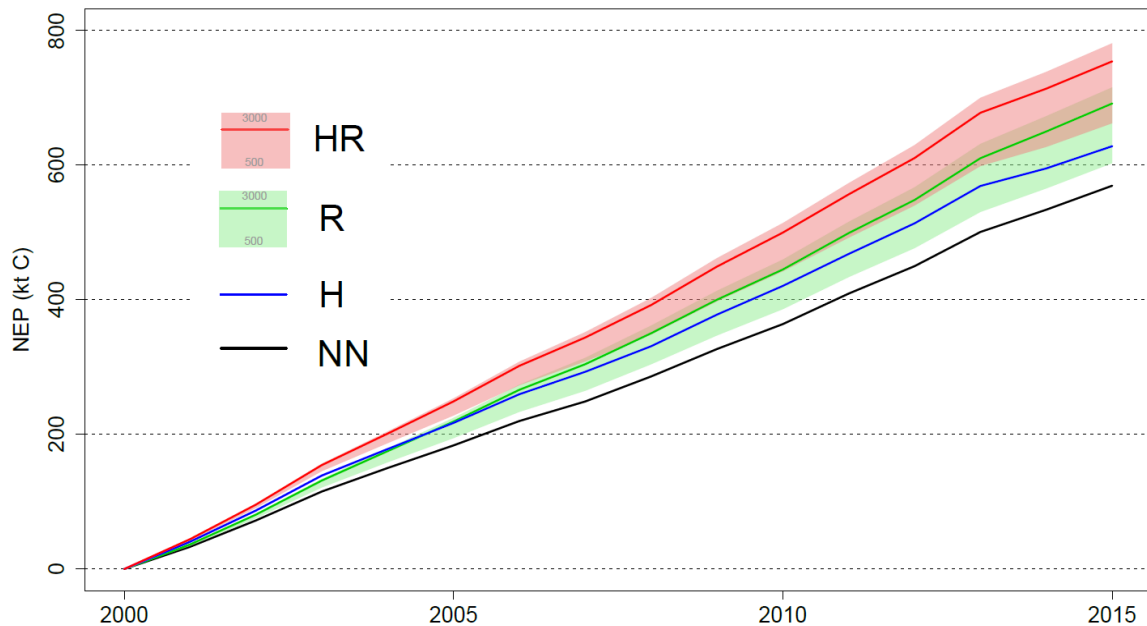
**Carbon sink between 2000
and 2015**



Understory effect



UNDERSTORY CONTRIBUTED 16-37% TO NET ECOSYSTEM PRODUCTION AND UP TO 65% IN DISTURBED AREAS



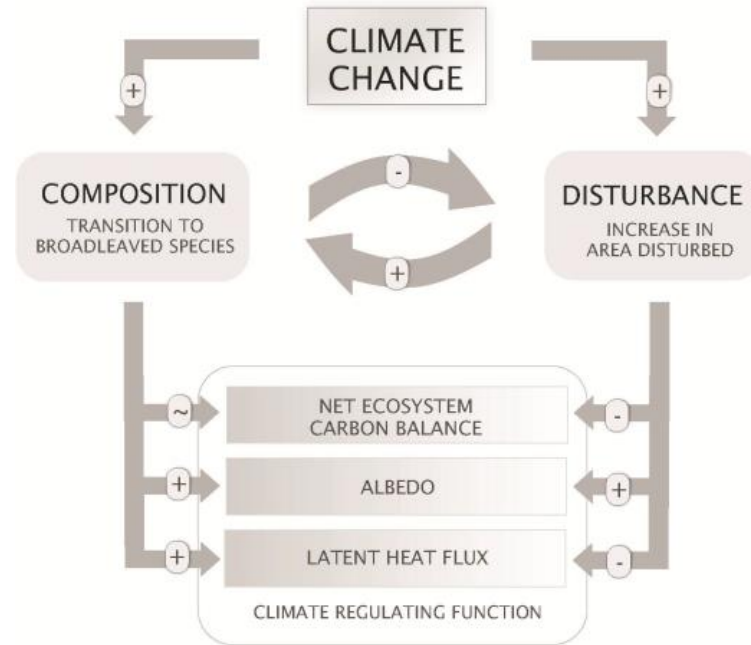
NN – no understory

R – tree regeneration

H – herb/grass layer

HR – tree regeneration + herb/grass layer

WHILE DISTURBANCE WILL INCREASE C LOSS, TREE COMPOSITION CHANGES MAY MITIGATE FURTHER CLIMATE CHANGE





CONCLUSIONS

- Climate change will accelerate forest disturbances causing a drop in forest C sink strength in the future
- Vital tree regeneration is crucial in reducing C loss after forest stand replacement
- The grass and herb layer developing in disturbance patches substantially reduces ecosystem C loss
- Long-term monitoring in combination with modelling and remote sensing is an ideal setting to study such complex ecosystem processes