

EM - 1 PROJECT



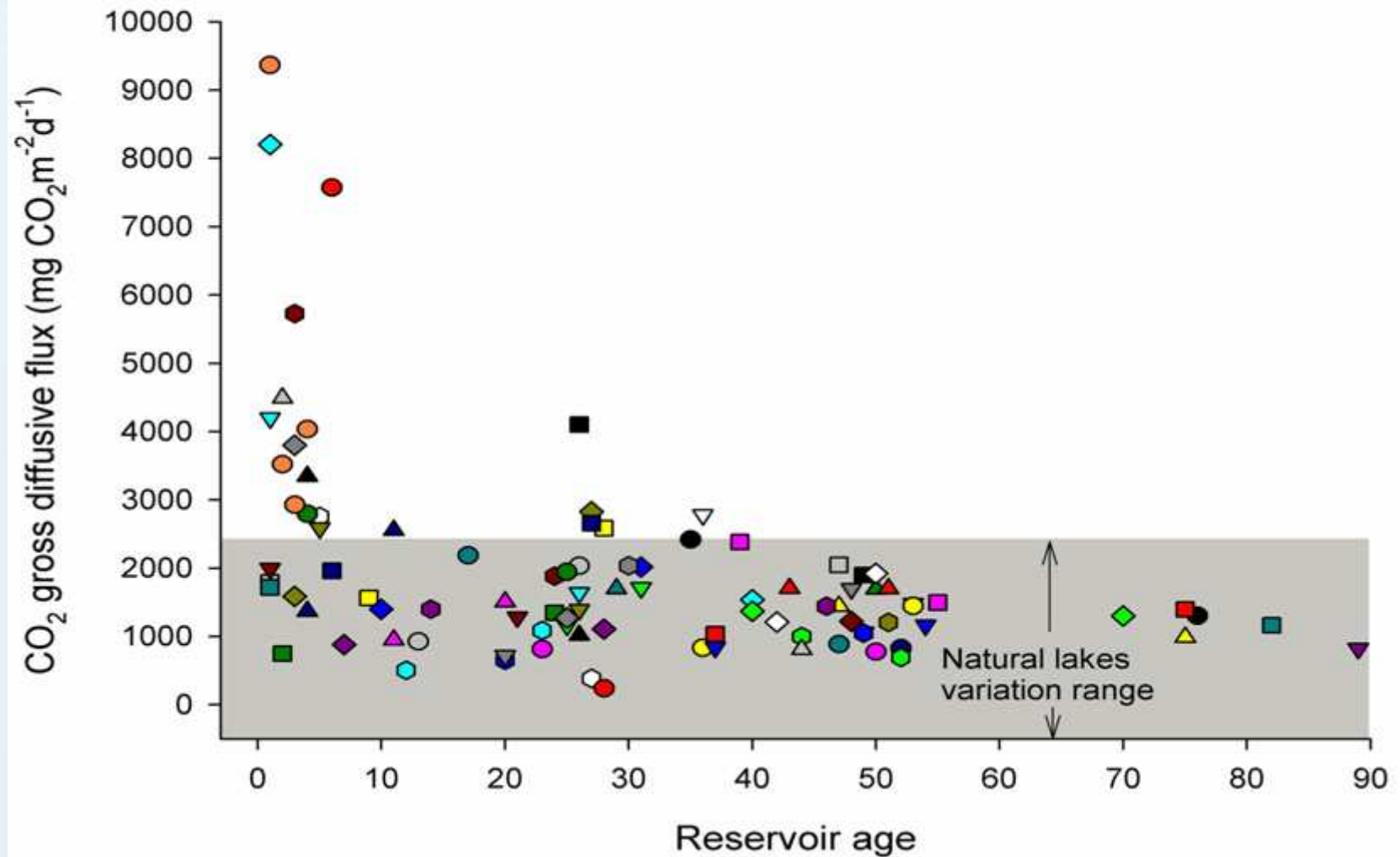
*Reservoirs' net greenhouse
gas emissions research project*

NET GREENHOUSE GAS EMISSIONS AT EASTMAIN 1 RESERVOIR, QUEBEC, CANADA

*Alain Tremblay, Julie Bastien, Marie-Claude Bonneville, Paul del Giorgio,
Maud Demarty, Michelle Garneau, Luc Pelletier, Yves Prairie, Nigel Roulet,
Ian Strachan, Cristian Teodoru*

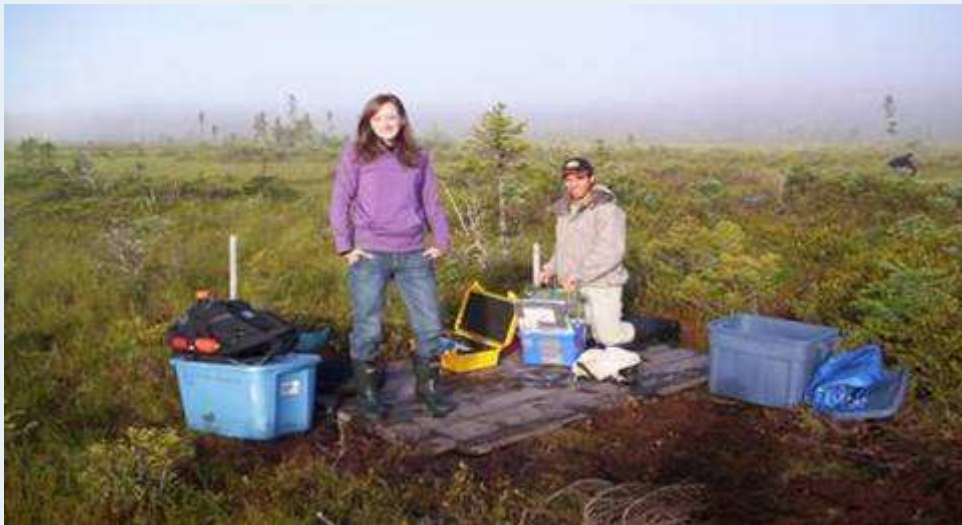
www.eastmain1.org

Measures of CO₂ gross emissions in Quebec reservoirs



Objectives

- Estimate net GHG emissions from a boreal reservoir
- The difference in carbon and GHG mass balance of natural ecosystems and the new system created over 100 years



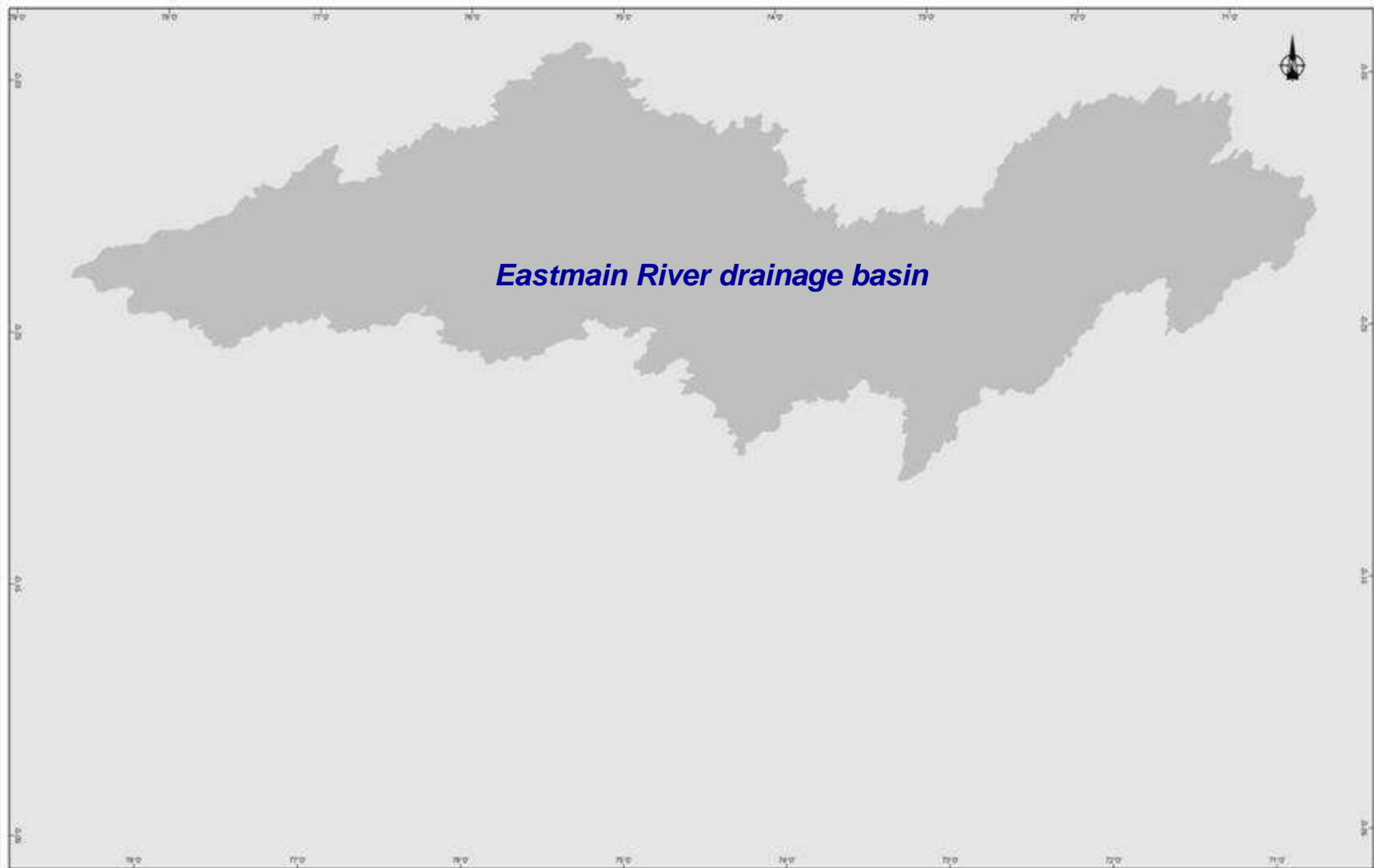
Characteristics of Eastmain 1 reservoir



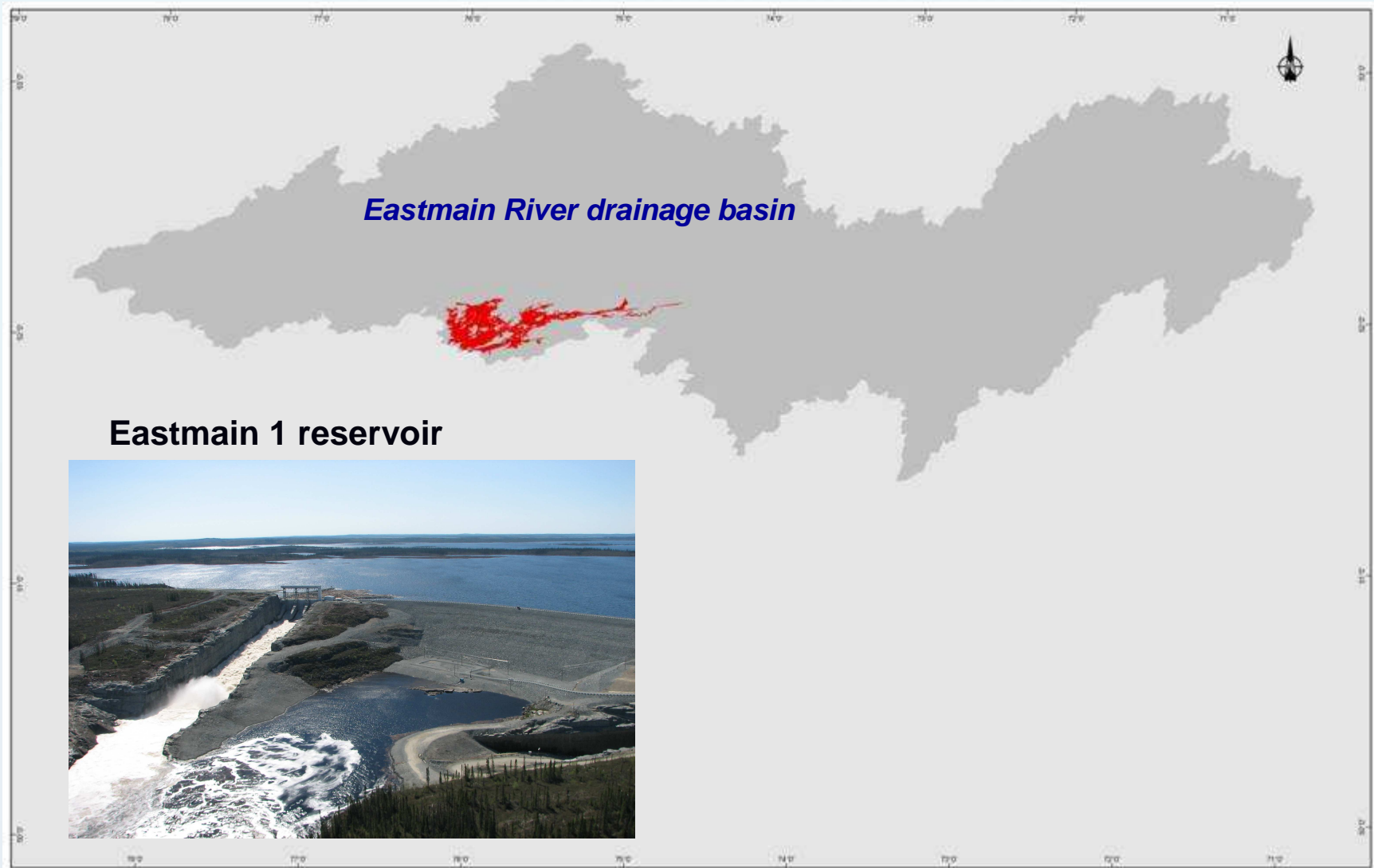
- **Impoundment: Nov. 2005 - May 2006**
- **480 MW Power plant EM-1 +780 MW EM-1A**
- **Reservoir: 603 km², 2.3 months, 11.5 m (z)**
- **Lakes and rivers: ~ 21%**
- **Forest: ~ 65%**
- **Peatlands: ~ 14%**

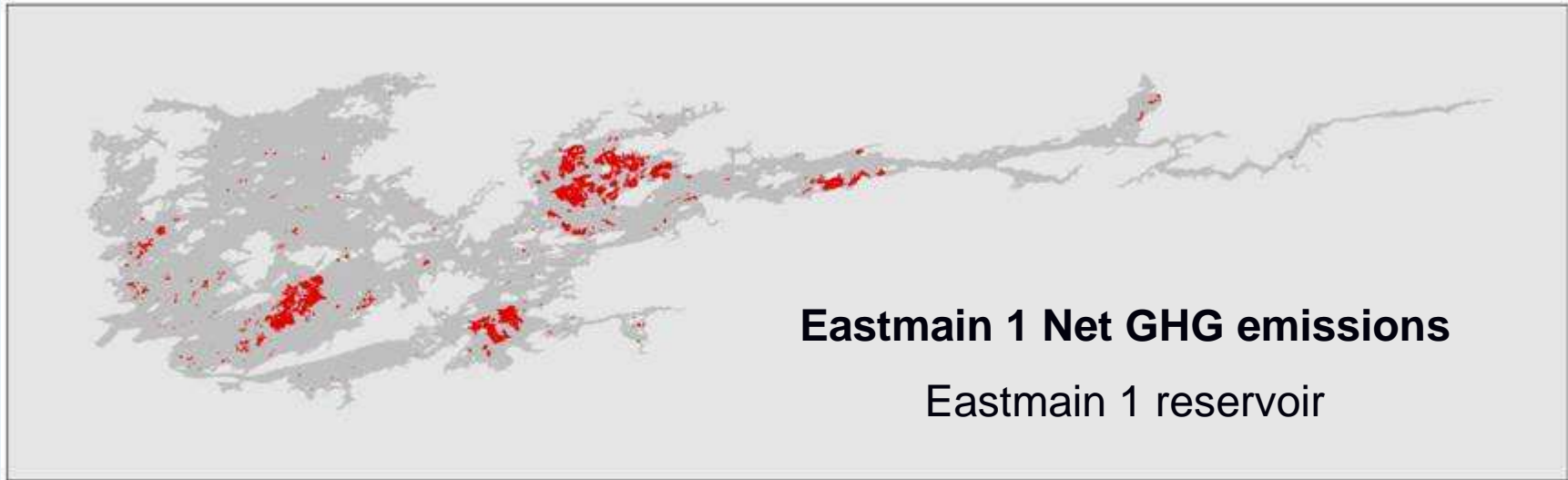


Net GHG Emissions for Natural Conditions



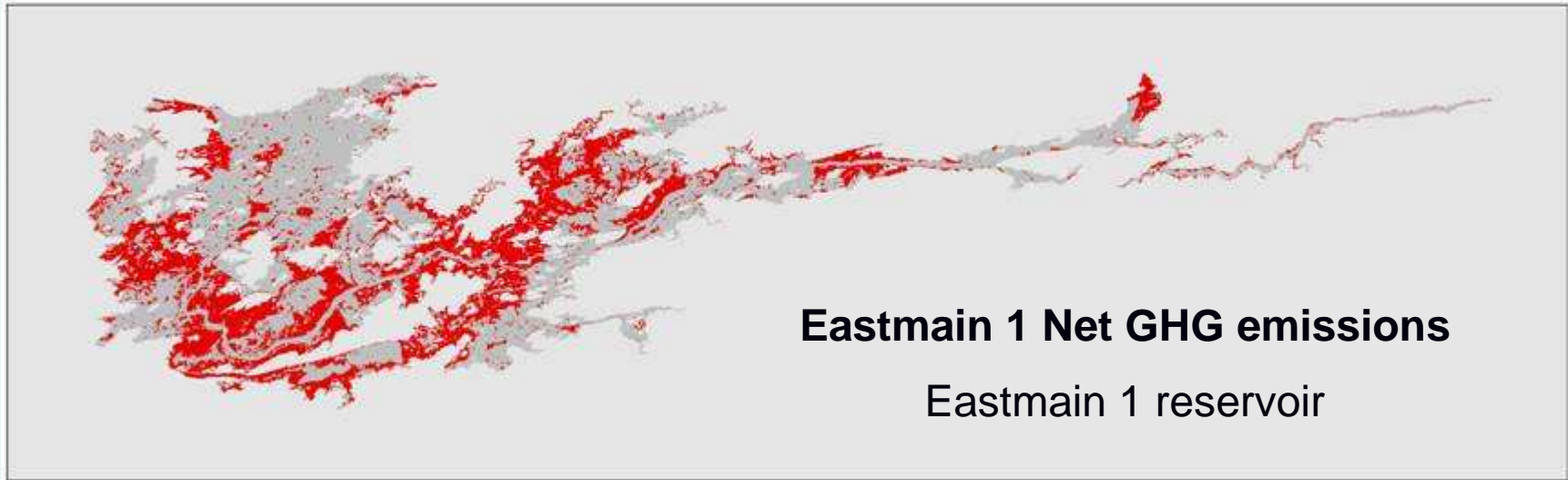
Eastmain 1 Net GHG emissions





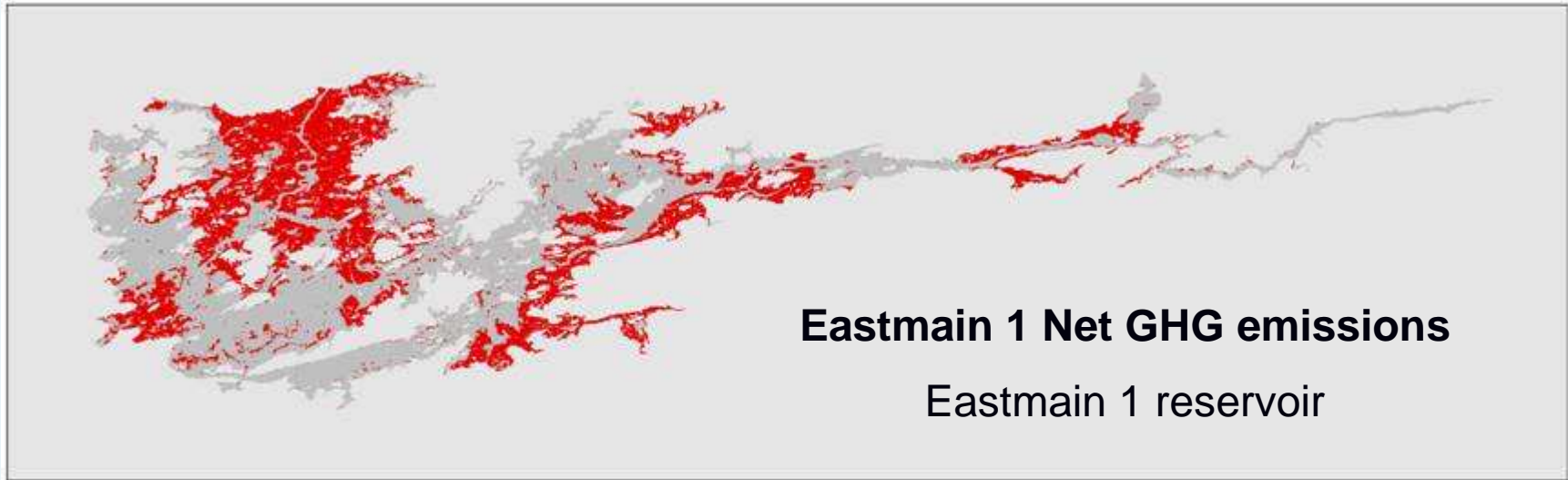
Wetlands





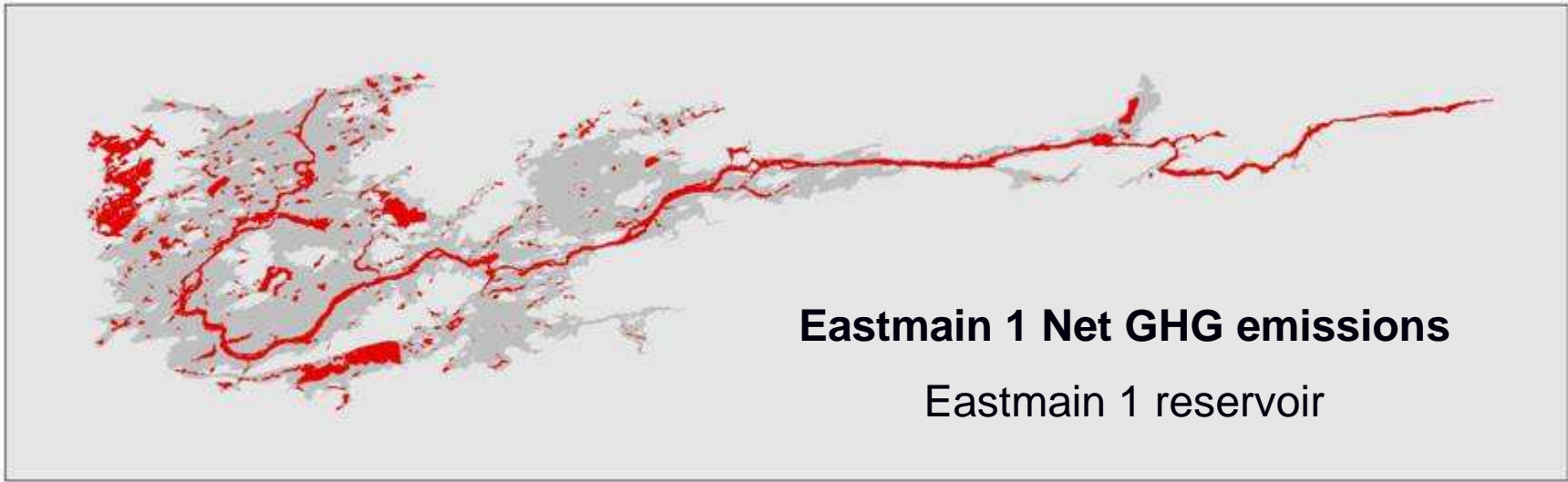
Forest





Forest fire



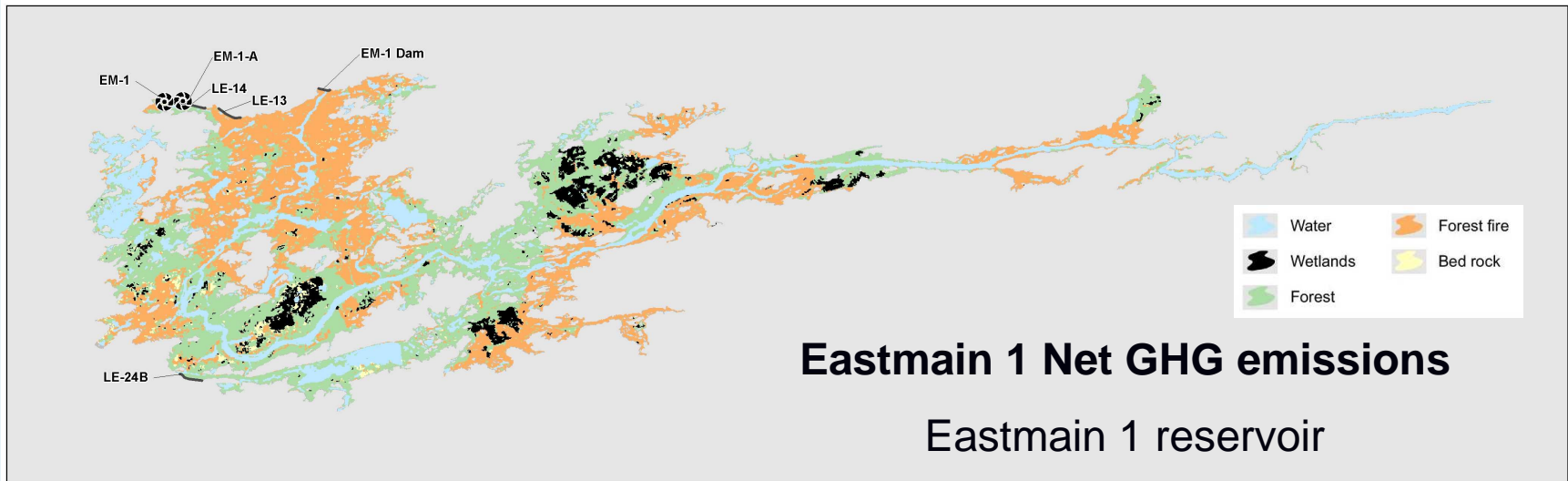


Water



+





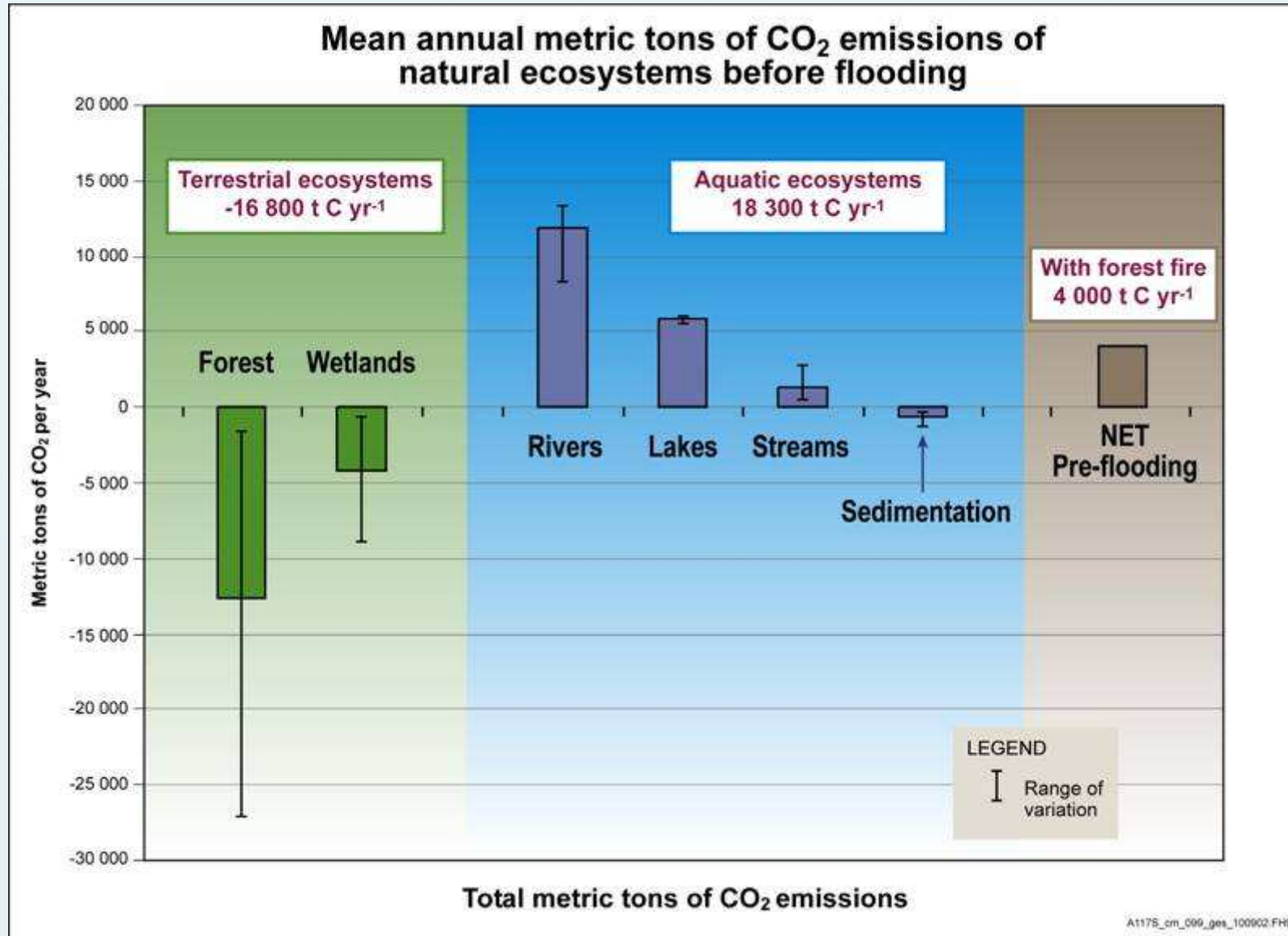
for 100 years

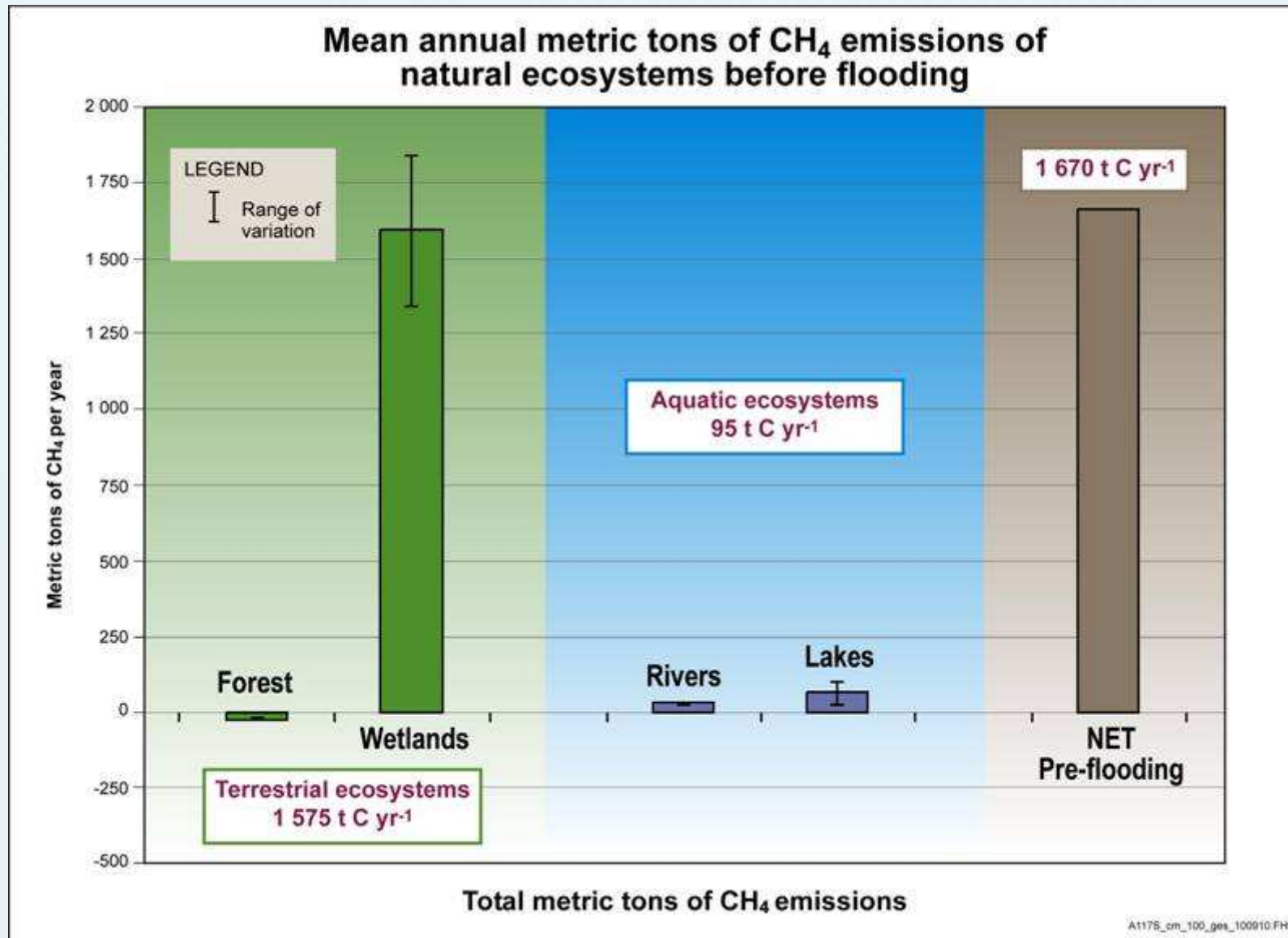


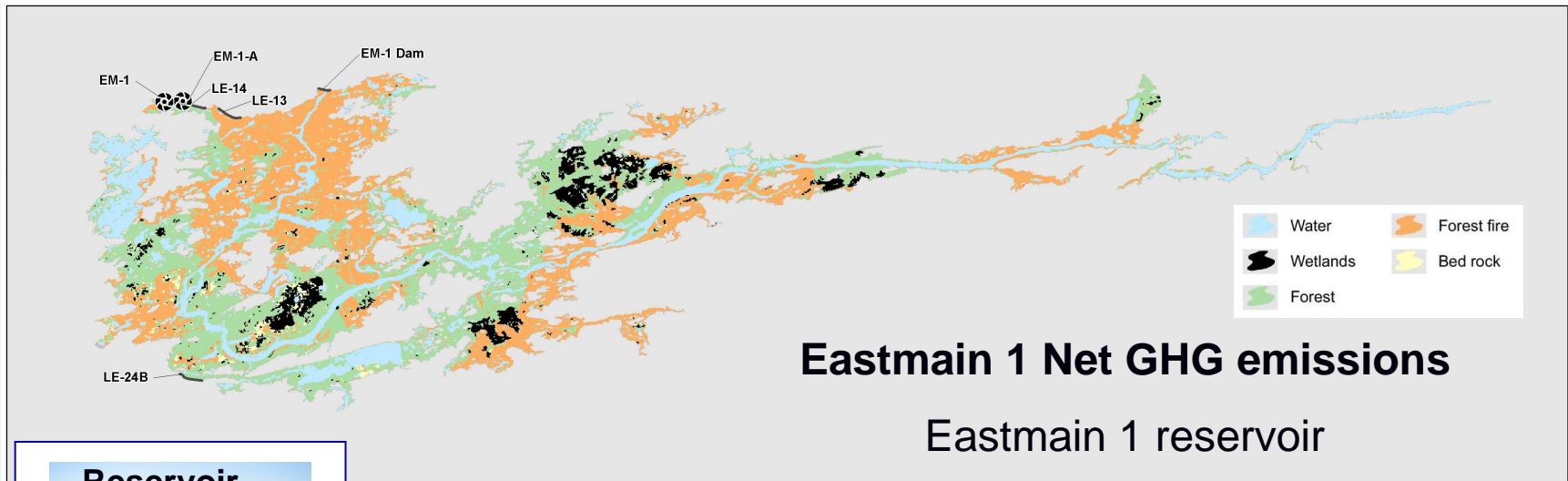
EM-1 PROJECT

*Reservoirs' net greenhouse
gas emissions research project*



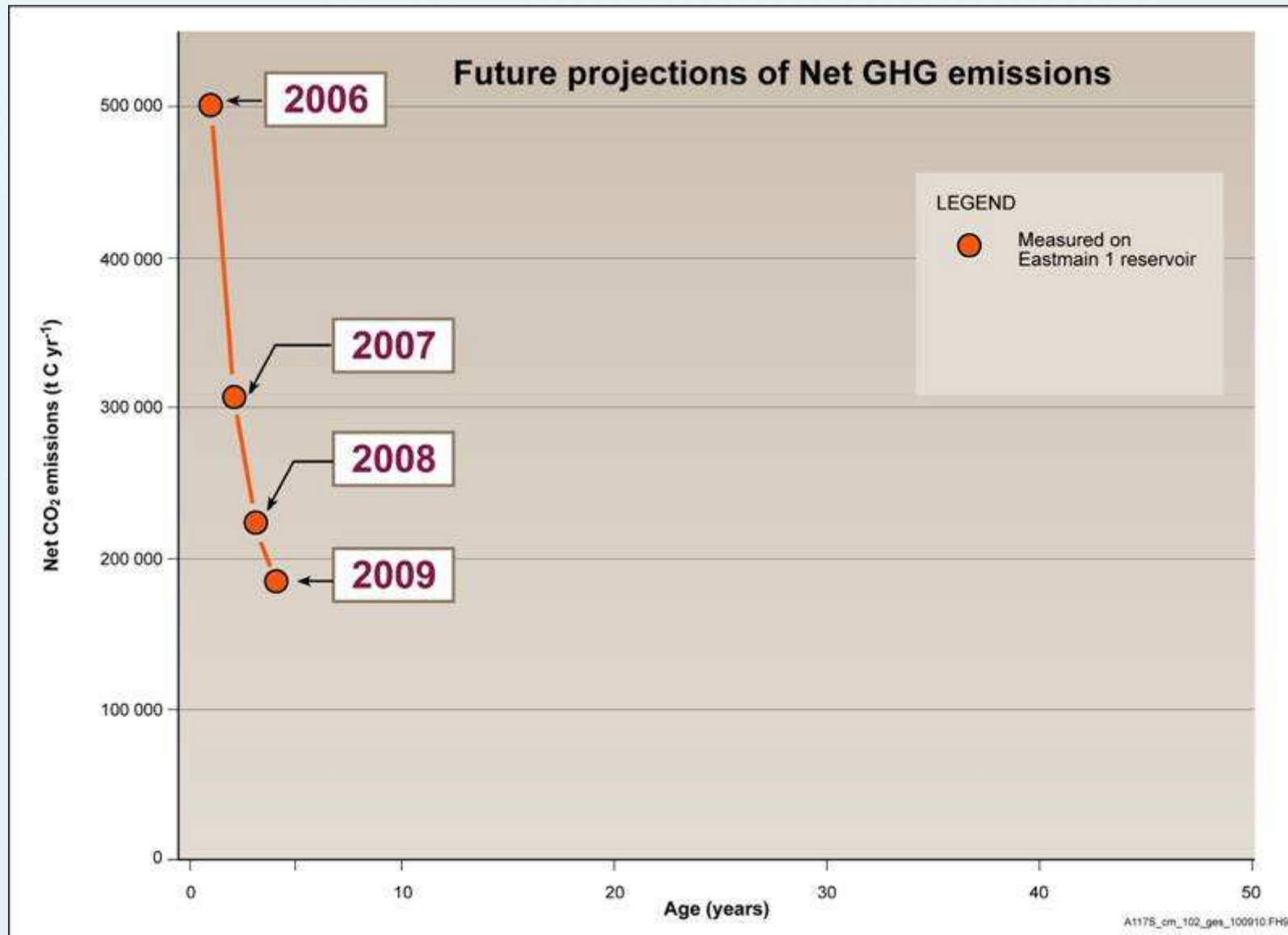


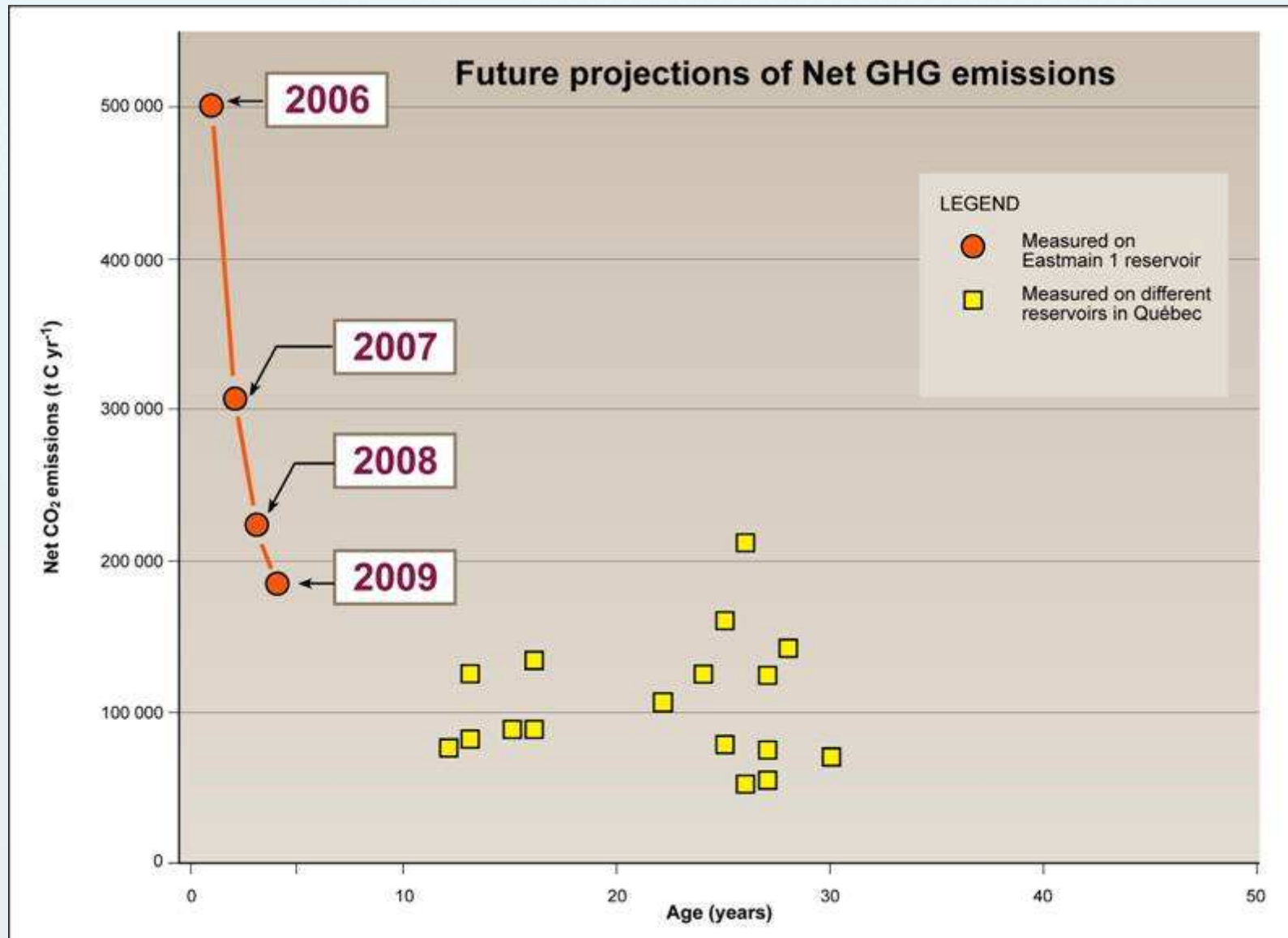


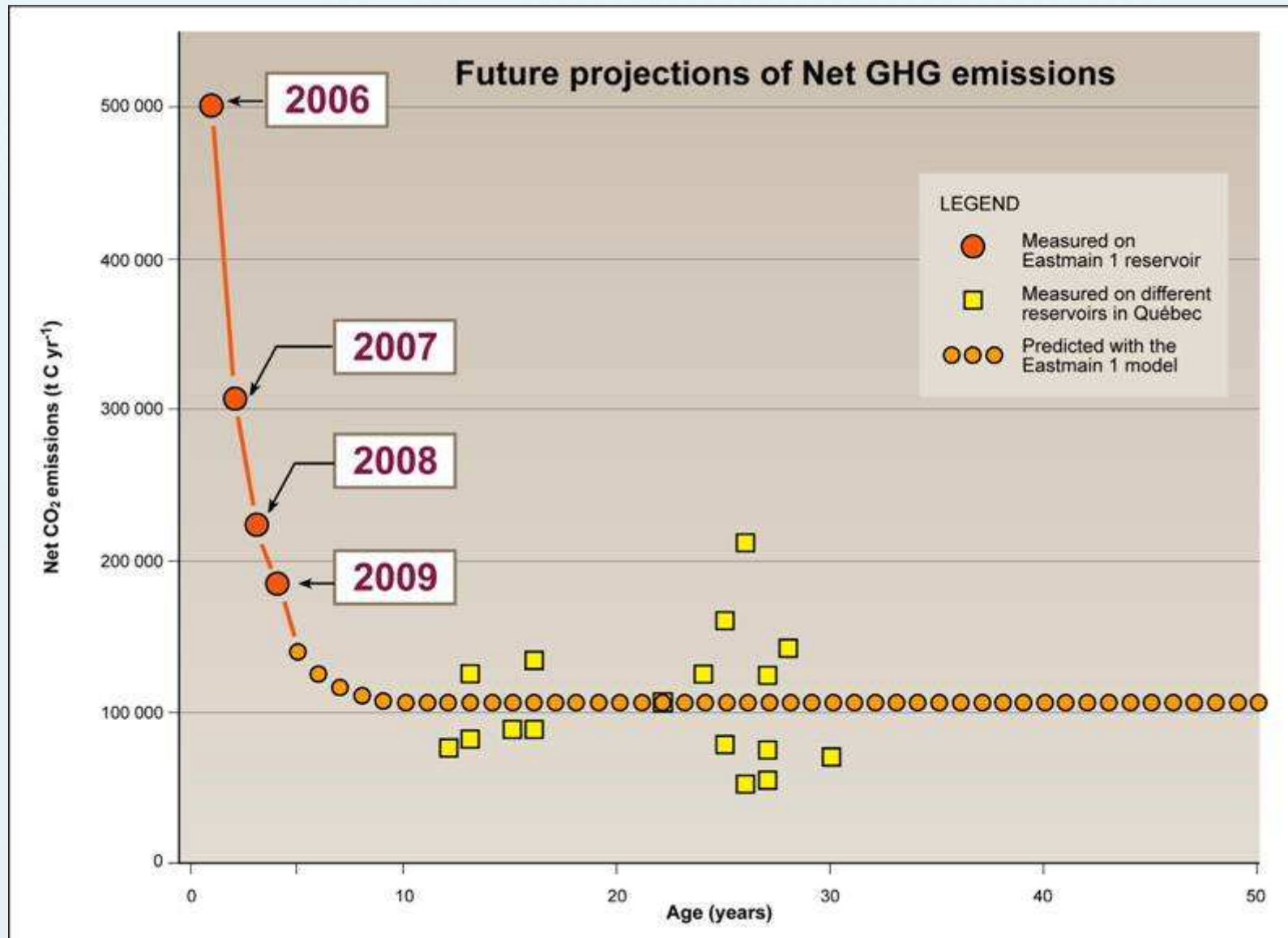


for 100 years

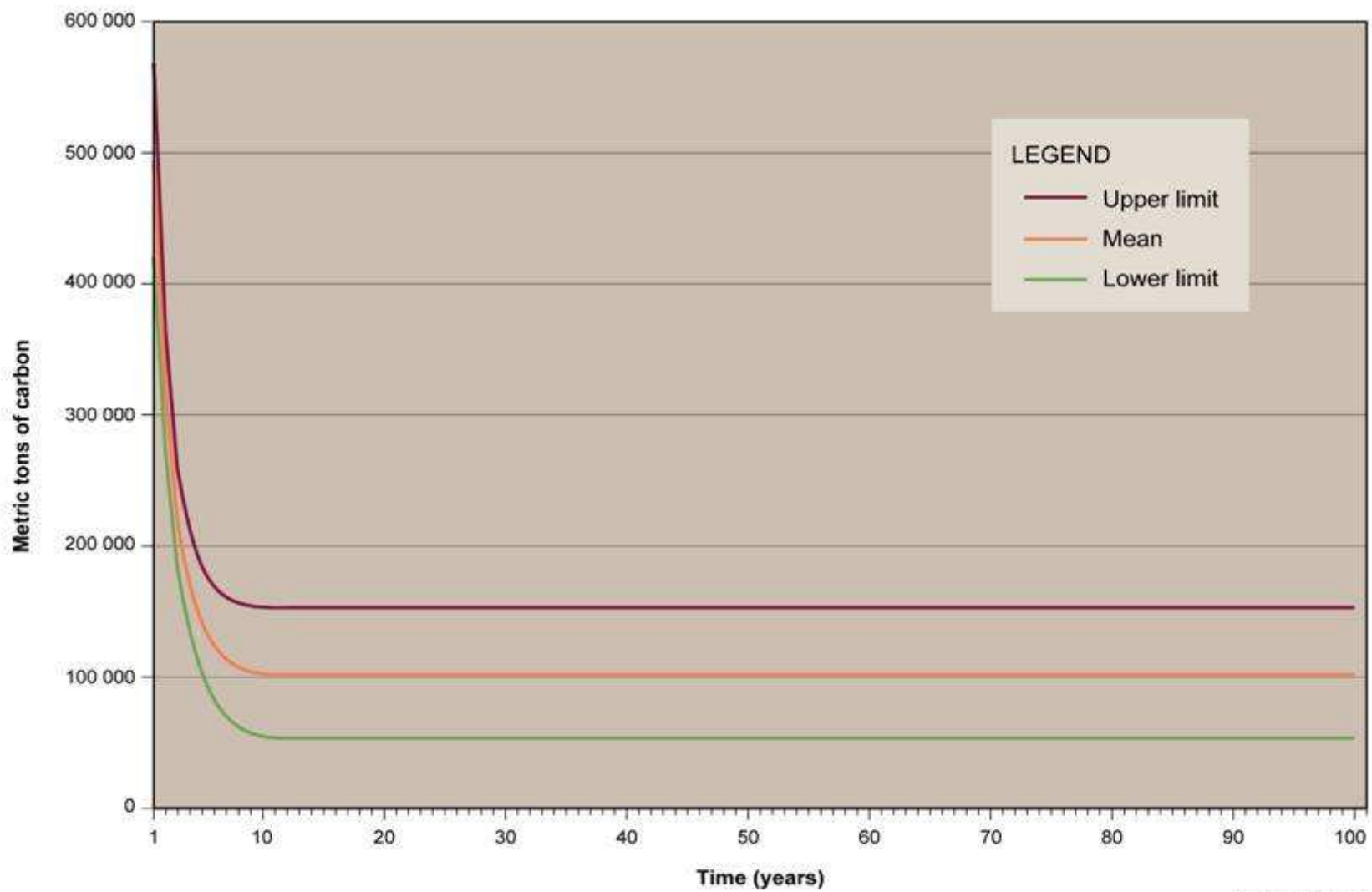








Metric tons of carbon over time at Eastmain 1 reservoir



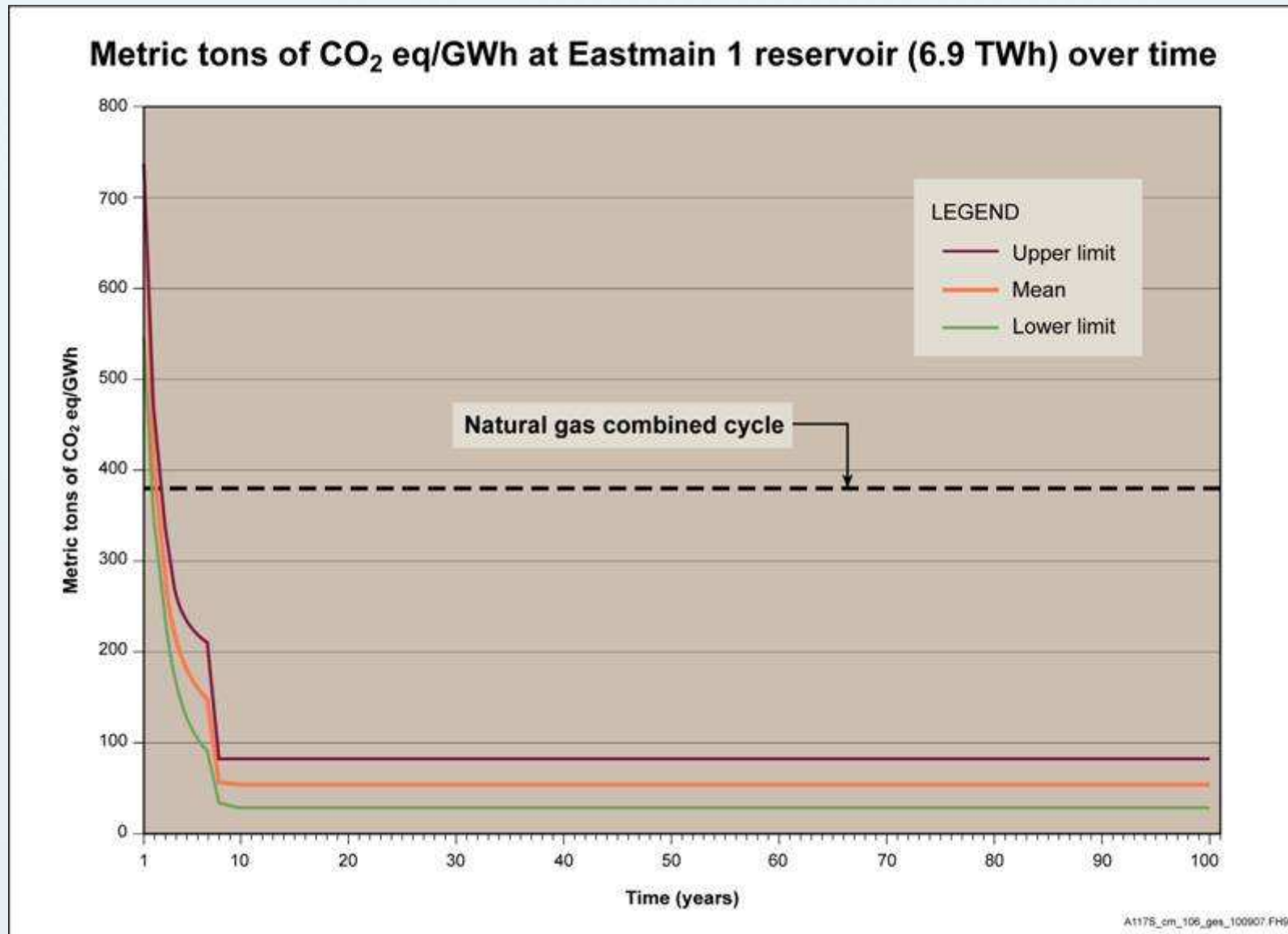
A1175_cm_097_ges_100602.FH9

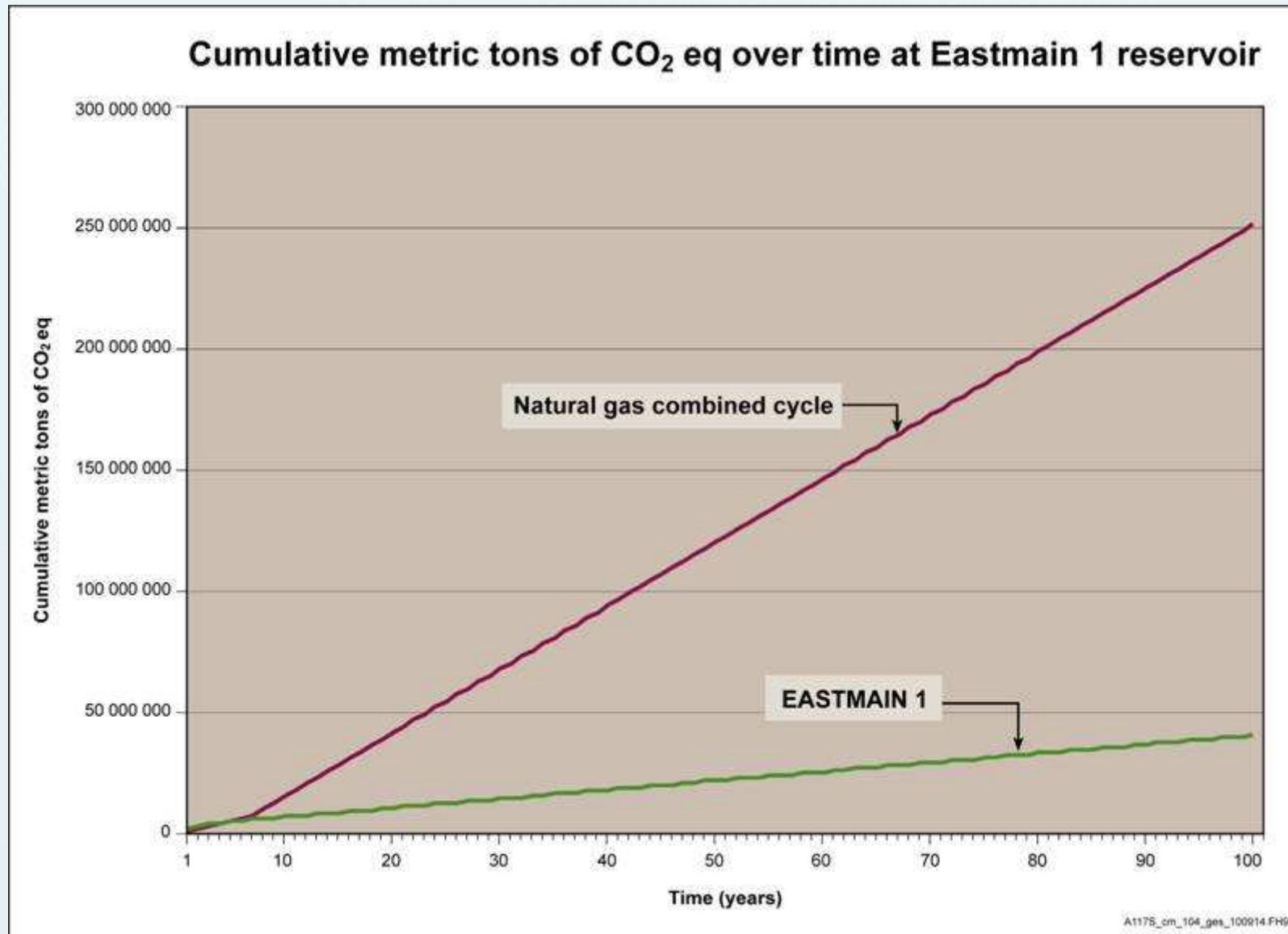


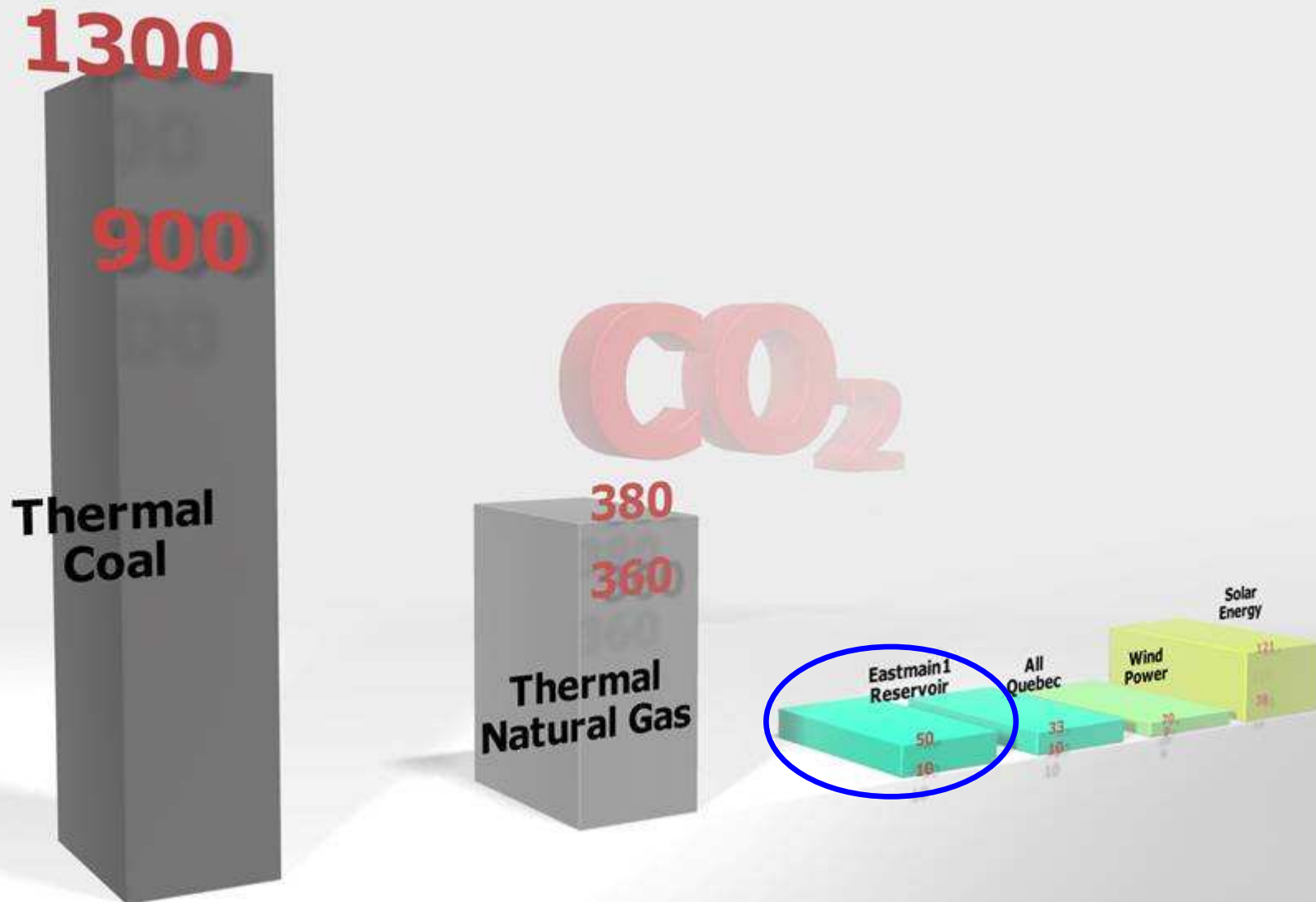
Conclusions

- **Natural ecosystems before flooding = a source of GHG**
 - Lakes, rivers, stream = source of CO₂
 - Forest, wetlands = sink of CO₂ and source of CH₄
- **Net Eastmain 1 reservoir = low GHG Emissions**
 - CO₂ is the major gas emitted
 - CH₄ fluxes are very small = not an issue in boreal reservoirs (<1%)
 - Degassing emissions not important (<1%)









Boreal reservoirs = Low GHG emitters



EM - 1 PROJECT



*Reservoirs' net greenhouse
gas emissions research project*

NET GREENHOUSE GAS EMISSIONS AT EASTMAIN 1 RESERVOIR, QUEBEC, CANADA

www.eastmain1.org