



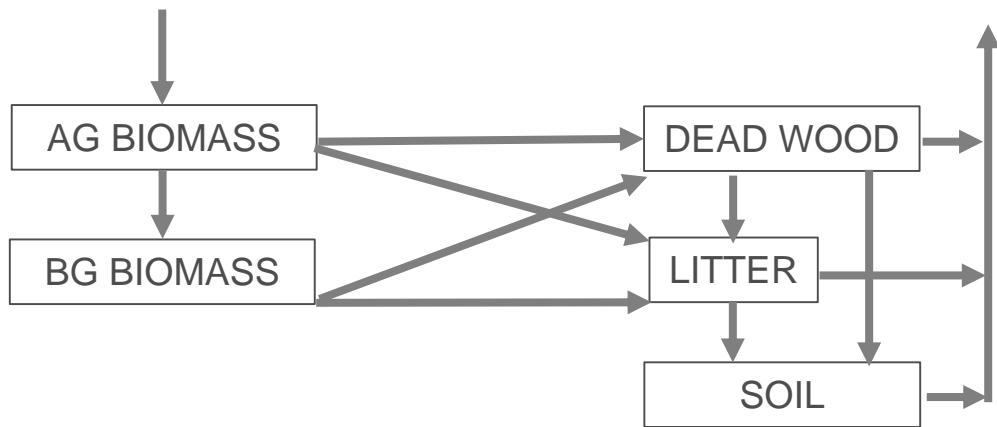
Natural disturbances & GHGs

JRC LULUCF workshop 2022

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Giacomo Grassi / JRC, 20 June 2022*

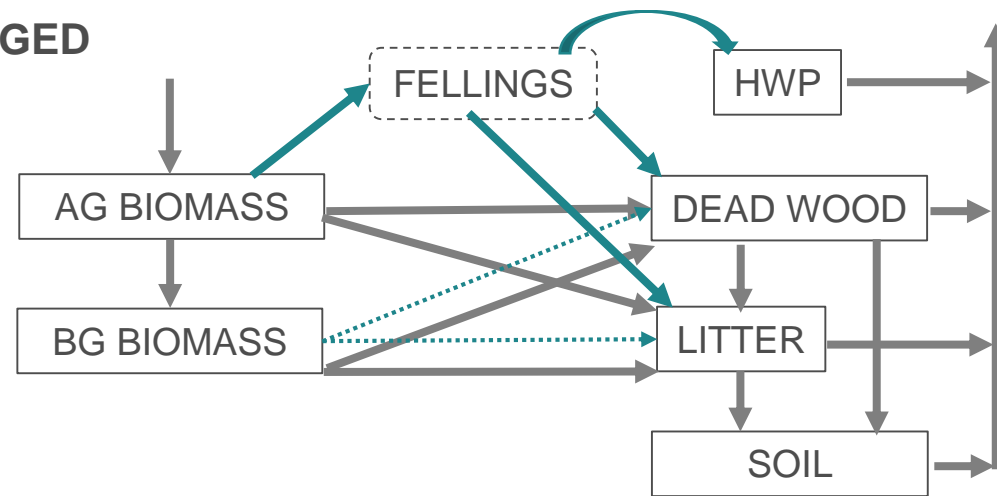
WITHOUT NATURAL DIST.

UNMANAGED



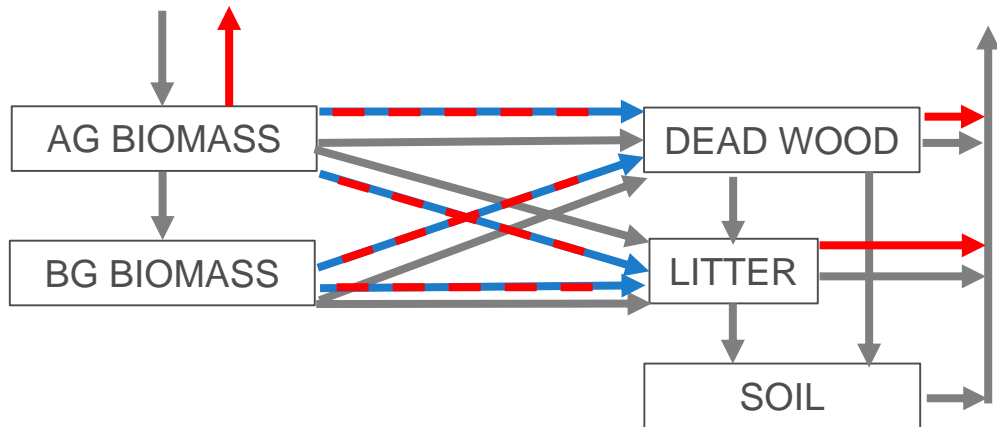
AG LB	BG LB	DW	LT	SOM	HWP
=	=	=	=	=	

MANAGED

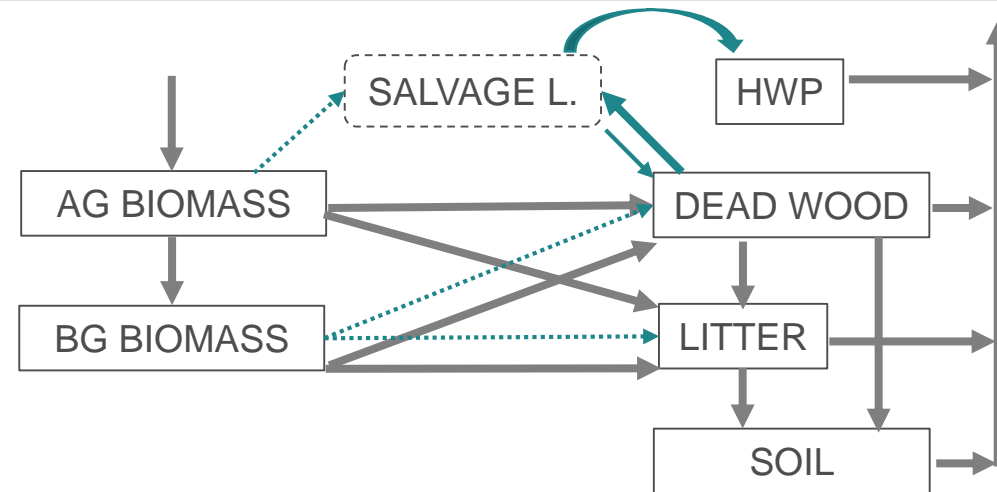


AG LB	BG LB	DW	LT	SOM	HWP
-	-	+	+	=	+

WITH NATURAL DIST.

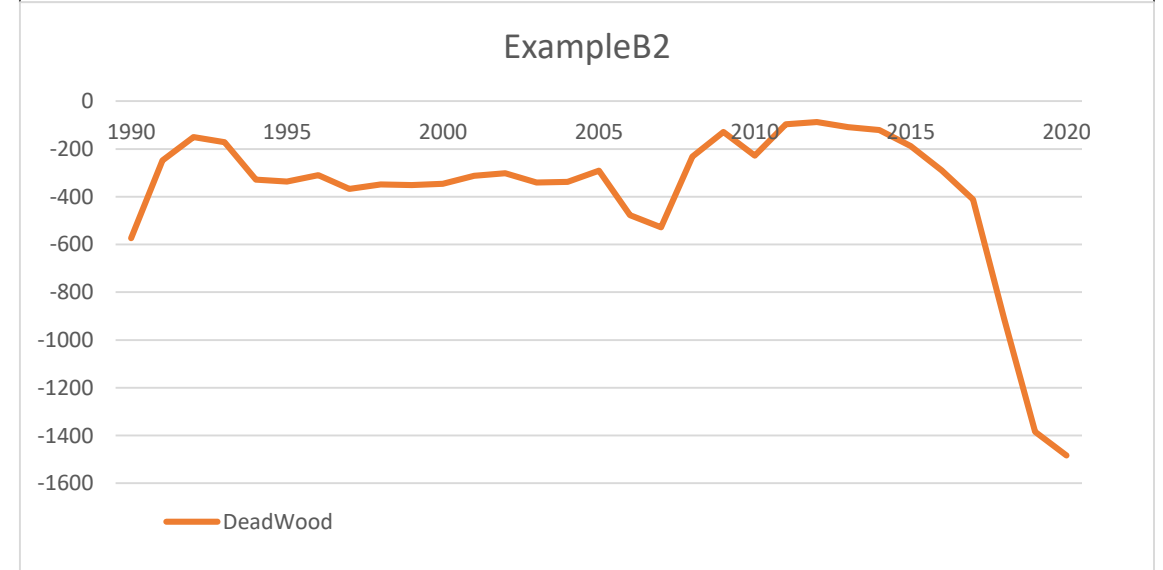
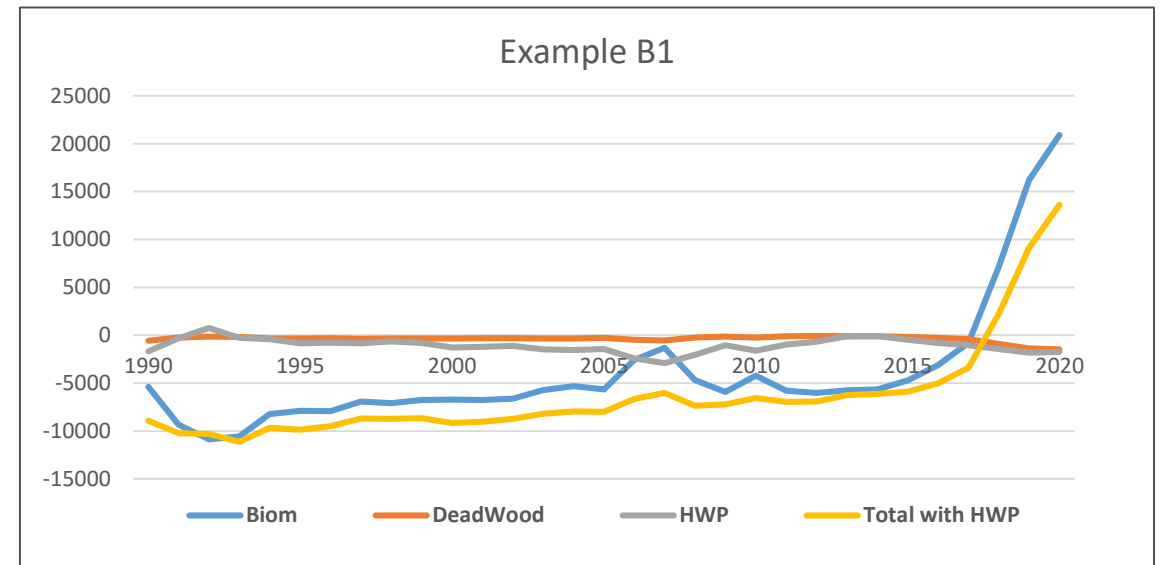
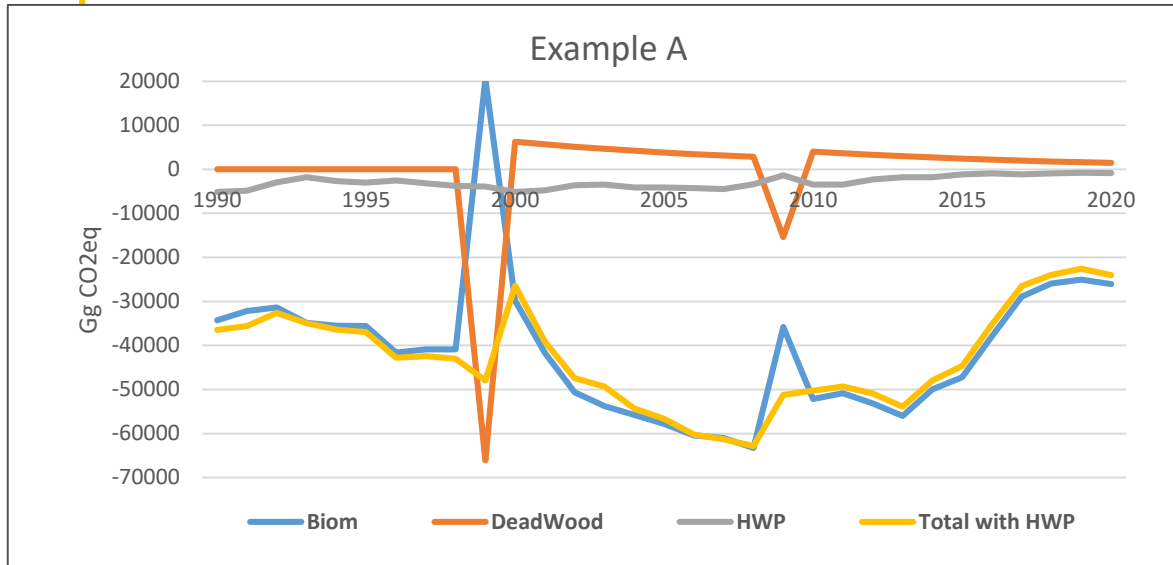


	AG LB	BG LB	DW	LT	SOM	HWP
Wind, Insects	-	-	+	+	=	
Fire	-	-	- / +	- / +	=	



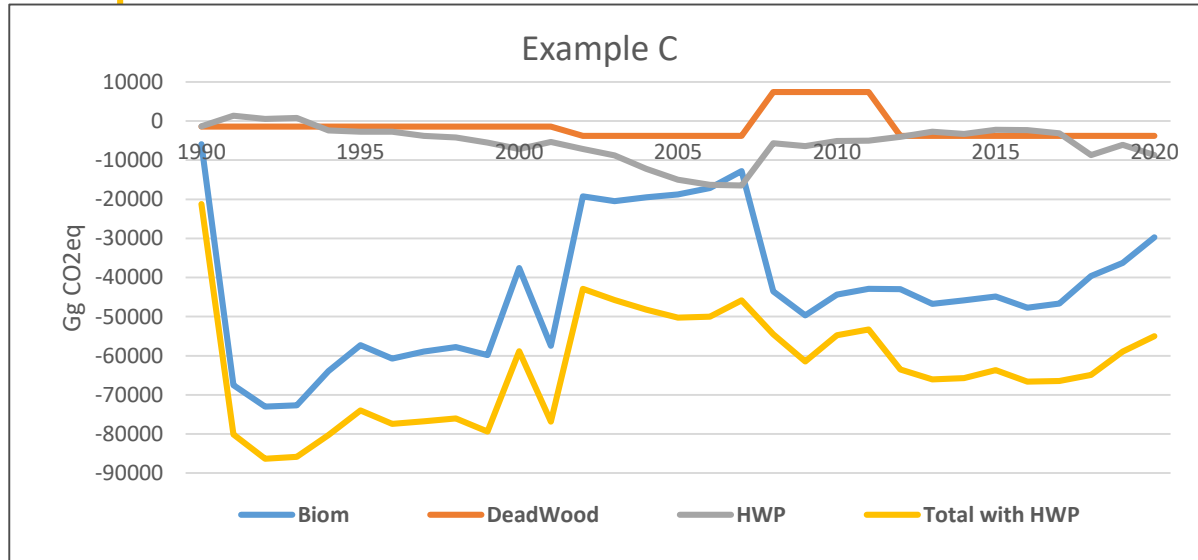
AG LB	BG LB	DW	LT	SOM	HWP
= / -	= / -	-	+	=	+

Some example: different countries ... different results

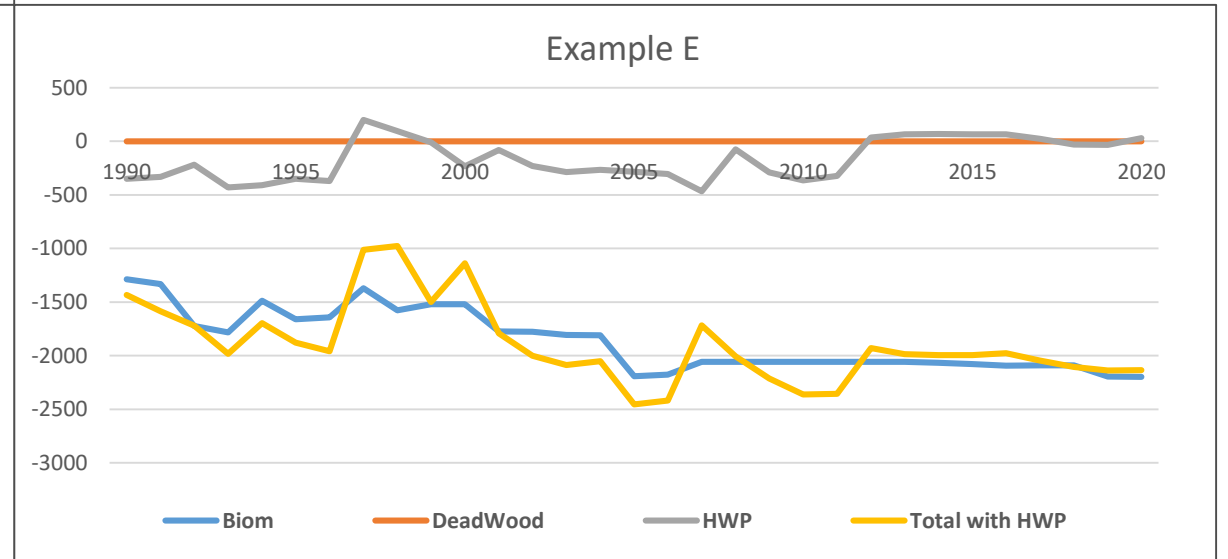
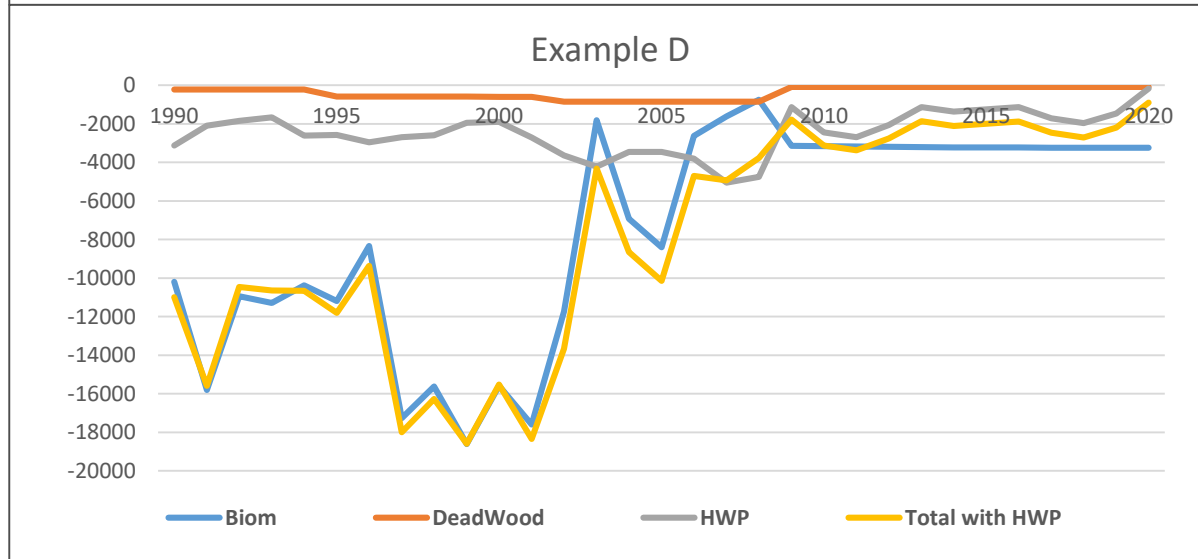


- Abrupt interannual variations on LB due to natural disturbances transfer a fraction of the LB to DOM
- **DW/DOM net C sink shows a negative correlation with LB net C sink**
- For ≈ 10 MS $r < -0.50$ between Δ LB and Δ DW (**Example A**)

Some example: different countries ... different results



- For most of MS DW/DOM net C sink (if reported) has no **significant correlation with LB**
- DOM/DW is not estimated on an annual basis and/or the modelling approach applied to DW/DOM is independent from the one applied to LB, i.e., it does not directly account for the transfer of biomass which occur (on annual bases) when some disturbance events affect LB.



- **When the LB C sink is mostly driven from “ordinary management practices”** (i.e., no abrupt disturbance events & salvage logging) → no abrupt variations on DOM pools → DOM (and $\text{Total} = \text{LB} + \text{DOM}$) net C sink can also be estimated **with a simplified approach** (for example with a stock change approach accounting for the long-term evolution of DW, i.e. no correlation between LB and DW/DOM).
- **However, when abrupt events, such as windstorms/fires and consequent salvage loggings, occur the lack of a direct linkage between LB and DW determines an under- (or over-) estimation of the overall net C sink, on annual basis.** This is because we only consider the effect on LB, missing to account for the opposite and partially compensating effect on DW.

- How different natural disturbances affect LB, DW and other C pools?
- Why are the same disturbances reported/considered within such a different way between MSs?
- Considering the increasing impact of natural disturbances, can we still ignore the direct linkage between DW/DOM and LB?