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Soil Organic Matter recovery on eroding alluvial surfaces on Iceland

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Soil Erosion has been assessed to have no significant effect on greenhouse gas releases due to the balance between decomposition, burial, and uptake from the atmosphere through photosynthesis by vegetation and subsequent litter decomposition. The validity of the "zero-emission" balance of soil erosion is limited to sites where vegetation growth is not limited by soil degradation. In this study, the recovery of soil organic matter on sites subject to severe erosion and subsequent soil reclamation by the introduction of Lupinus nootkatensis is studied. Preliminary results indicate that the recovery is extremely slow (scale of decades). In particular, an incipient soil development, including the availability of freely available nitrogen, appear to limit the establishment of a closed vegetation cover. These results therefore indicate that in situations where land degradation leads to a complete destruction of the fertile soil layer, the assumption of dynamic replacement of eroded soil Carbon stocks cannot be applied.