

ASSESSING THE TRANSFERABILITY OF ECOSYSTEM SERVICE PRODUCTION ESTIMATES AND FUNCTIONS

Theodore H. DeWitt¹, Jessica B. Moon², Melissa N. Errend³, Miranda E. Gray³, and Randall J.F. Bruins⁴

¹US EPA, NHEERL Western Ecology Division, Newport, OR, USA

²ORISE Postdoctoral Fellow at US EPA, Newport, OR, USA

³Hatfield Marine Science Center, Newport, OR, USA

⁴US EPA, NERL Ecological Exposure Research Division, Cincinnati, OH, USA

Estimates of ecosystem service (ES) production, and their responses to stressors or policy actions, may be obtained by direct measurement, other empirical studies, or modeling. Direct measurement is costly and often impractical, and thus many studies transfer ES production estimates or models that were obtained or developed in other contexts. This is analogous to socioeconomic benefits transfer, but in the ecological realm. However, few studies rigorously assess the assumptions, accuracy, and errors associated with ecological information transfers, nor the implications for using these estimates at new sites. We have developed methodology to help assess the risk of transferring ES estimates and models. For ES estimates, the transferability assessment (TA) focuses on identifying the expected level of variance in a transferred estimate by describing the contextual differences between the estimate's origin and the transfer site. For ES models, the TA focuses on evaluating the transferred model's potential performance level given both contextual differences between sites and possible changes made to the model. A key part of this work is identifying contextual information that might predict the success of a transfer and creating metrics of contextual difference. The TA was designed in collaboration with the development of EPA's Ecosystem Service Production Function Library (EPFL). We demonstrate an example of a TA, including how transfer reliability can be visualized across dimensions of context.

Contact Information: Ted DeWitt, US Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Western Ecology Division, 2111 SE Marine Science Dr., Newport, OR 97365 USA, Phone: 541-867-4029, Email: dewitt.ted@epa.gov