Comment: “Natural Capital Considerations for an Extension of the U.S. Marine Economy Satellite Account” by Jeffrey Wielgus, et al

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Quantifying and valuing natural capital is needed to provide a holistic view of economies and assess tradeoffs between growth, development, and impacts to the natural environment. The marine environment is home to a variety of natural capital assets that provide a diverse array of valuable ecosystem services. Measurement and tracking of the value of marine natural capital has been acknowledged as important for some time and several countries are beginning to develop ocean ecosystem accounts to complement existing national accounts. In the United States, ocean-based economic activity is wide ranging, including extraction of non-renewable and renewable natural resources; transportation, shipping, and trade; recreation; and research, education, and management. These activities depend on, and derive surplus value from, marine natural capital. “Natural Capital Considerations for an Extension of the U.S. Marine Economy Satellite Account”, hereafter Weilgus et al. 2023, proposes three pilot extensions of the existing Marine Economy Satellite Account (MESA) to incorporate information on natural capital stocks and value for: offshore oil and gas, commercial fisheries, and beach recreation. These three industries are dominant sectors in the U.S. ocean economy and represent renewable and non-renewable resources, as well as extractive and non-extractive uses. Piloting extensions across this diverse range of industries should facilitate progress in natural capital accounting more broadly as common challenges are encountered and standard approaches arrived at.

The United Nations System of Environmental-Economic Accounting Central Framework (UN SEEA-CF) discusses three approaches for estimating natural capital asset values: the appropriation method, where rent values are based on asset sales; the residual value method, where rent is estimated as gross revenues net costs; and the access price method, where resource use licenses are limited, freely traded, and the access price corresponds to rents. This range of valuation approaches is well represented in the pilot extensions to MESA proposed in Weilgus et al. 2023. In offshore oil and gas, winning bids for exploration and extraction rights to specific areas of seabed convey information about expected resource rents and can be used in natural capital valuation. Bids are made under imperfect information however, leading to some divergence between payments and realized rents that should be further explored. For commercial fisheries, valuation approaches are proposed that include utilizing permit and quota transaction data from fisheries managed with limited access privilege programs as well as calculation of residual value (rent) by deducting fishing costs from landings revenues. In some instances, both methods may be able to be applied in the same fishery, which should provide useful comparisons. When considering beach recreation, it is noted that a variety of studies have documented willingness-to-pay, however information on rates of beach use are less available and additional data collection may therefore be needed. In all instances, market distortions created through government policies, industry structure, or other factors should be carefully considered.

Quantifying natural capital values requires information on physical stocks. For both offshore oil and gas and commercial fisheries, federal agencies maintain information on stock levels, which could be used to develop physical accounts. The definition of natural capital stock for beach recreation is less straightforward and will require efforts to identify and measure those properties determined to define the stock, which is potentially an opportunity for advancement of natural capital accounting methodologies. Across applications, stock boundaries and structure can be influenced by exogenous environmental conditions and evolve over time in response to physical forcings. Discoveries and shifts in human use add further dynamics in physical asset levels. Intertemporal considerations will likely be important in developing natural capital accounts that facilitate comparisons over time.

Valuation of natural capital is critically important to understanding and informing pressing environmental-economic tradeoffs. There remain a number of difficulties in operationalizing natural capital accounting, however. Weilgus et al. 2023 note several challenges associated with available data and proposed valuation methods, including: data quality and coverage, the influence of confounding factors on resource rent estimates, and the complexity of ecosystems. In addition to these, the proper partitioning of value to avoid double counting should be considered important. Valuing final services exclusively is recommended in general, though complex interdependencies between habitats, biological or physical resources, and human activities may complicate this in practice. Despite these and other difficulties, progress in natural capital accounting is being made. The pilot extensions to MESA proposed in Weilgus et al. 2023 represent substantial advances in natural capital accounting of U.S. marine resources. Development of these and other natural capital accounts should be expected to provide many salient lessons and produce data that complements existing national accounts, ultimately facilitating increased consideration of marine natural capital values in ocean development and governance.