Moving from functions to benefits without dollars: Using non-monetary indicators for prioritizing wetland restoration with a flood risk reduction example

Wetlands functional assessments have gained traction as a means to compare wetlands on their ability to produce benefits for people. However, such assessments stop short of actually connecting wetland benefits to people. This means a wetland may be highly productive, yet have a comparatively low value. This can be because people do not actually receive the wetland's benefits or because the people receiving the benefits already get those benefits elsewhere, and therefore do not value them highly. Valuation studies are able to address the value of wetlands by monetizing it, but such studies are often too intensive for the type of localized decisions that need to be made, and it is not possible to monetize all benefits.

We developed a framework, based on economic theory and concepts, which defines a set of non-monetary indicators for wetland benefits. This set of benefit indicators includes: indicators of quantity and quality of valued ecological outputs and the expected reliability of provision over time; the number of beneficiaries and strength of preferences; substitutes, complements and the elasticity of demand; and overall supply relative to demand. Using the framework, a set of benefit indicators was developed for a single wetland benefit: flood prevention. To ensure the flood prevention benefit indicators were robust, they were derived from hydrologic, hydraulic and floodplain modeling performed in the Woonasquatucket watershed (Providence, RI). We will demonstrate how the indicator set could be used to quantify the flood reduction benefits of alternative wetland restoration scenarios. This quantification of benefits allows the user to compare scenarios based on benefits for more informed decisions and better prioritization of wetlands restoration. When flood reduction benefit indicators are considered alongside other wetland benefit indicators for the same scenarios the user is able to compare the scenarios based on trade-offs between the different wetland benefits.