Economic-engineering method for assessing trade-offs between instream and offstream uses

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Rivers provide multiple water uses and services, including offstream uses that are valued economically and instream uses, such as recreation and ecosystem preservation, that are rarely valued economically. In many countries, water rights allocate water to offstream uses, and dedicated minimum instream flows are the main instrument for instream water allocation. However, minimum instream flows do not ensure continuous reaches for recreation or aquatic habitats. An efficient allocation of water for instream uses requires quantifying the benefits obtained from those uses, so that trade-offs between instream and offstream water uses can be weighed against each other and properly considered. This study develops a generalizable, hybrid economic-engineering method to assess trade-offs between competing instream and offstream uses. Benefit curves measure recreation quality as a function of instream flow, and opportunity costs given by lost benefits of