# 基于 Meta 回归方法的中国内陆河流域
# 生态系统服务价值再评估

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**摘要：**将流域生态系统服务的经济价值纳入成本效益分析，是解决生态环境问题和实现流域生态资源可持续配置的关键。近年来随着价值评估文献量增加，评估的价值及其影响因素等研究结论由于存在诸多争议而难以应用于管理实践。首次应用 Meta 回归分析对中国内陆河流域生态系统服务的价值进行综合再评估，结果发现：在价值评估研究中研究对象、受访者、测度方法、撰写发表等 4 个环节的特征对评估价值均具有显著影响，其中，石羊河和塔里木河的评估价值显著高于黑河，上游的评估价值显著高于中游和下游，二分式条件价值评估法所评估的价值与选择实验法没有显著差异，但显著高于其他条件价值评估法；此外，时间对评估价值呈现显著"衰减效应"，每年下降 2%~3%，且期刊文献的评估价值显著高于其他文献的评估价值；通过运用 $n-1$ 数据分割技术，本文将 Meta 回归方程结果运用到样本外效益转移并对其进行评估，得到的中位数转移误差为 27.12%。相较于现有研究，该结果处于可接受范围。因此，本文运用的 Meta 回归分析适用于中国内陆河流域效益转移政策地的生态系统服务价值评估。
**关键词：**生态系统服务价值评估；Meta 回归分析；$n-1$ 数据分割技术；内陆河流域
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# Revaluation of ecosystem services in inland river basins of China:
## Based on meta-regression analysis

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**Abstract:** Incorporating the economic value of river basin ecosystem services into cost-benefit analysis is the key to solving environmental problems and achieving a sustainable allocation of water resources in river basins. In recent years, with the increase in valuation literature, there has been much controversy in terms of the amount of value and its influencing factors, which has made it difficult to apply these research results to management practices. In this paper, the meta-regression analysis is first applied to the valuation of ecosystem services in the inland river basins of China. The results show that the valuation can be significantly affected by characteristics of the four aspects of valuation research, specifically: object, respondents, measurement method and publications. Among them, the valuation of both the Shiyang River and the Tarim River is significantly higher than that of the Heihe River. The valuation of the upstream portion is significantly higher than that of the middle and lower reaches. The value assessed by the dichotomous choice contingent valuation method is not significantly different from that of the choice experiments. However, it is significantly higher than values obtained by other contingent valuation methods. In addition, valuation over time shows a "declining effect" of 2%-3% per year and valuation in journal literature is significantly higher than that in other forms of literature. By using the $n-1$ data splitting technique, we applied the results of the meta-regression to out-of-sample benefit transfer, evaluated it, and found a median error of 27.12%. Compared with the existing research, the results are in an acceptable range. Therefore, the meta-regression analysis used in this paper is applicable to the valuation of the ecosystem services of the policy sites in the inland river basins of China.

**Keywords:** ecosystem services valuation; meta-regression analysis; $n-1$ data splitting technique; inland river basins; China