23. Evaluating Conversational Interfaces in WebGIS Applications: A Case Study on Forest CO2 Sequestration Valuation

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This study investigates how Large Language Model (LLM)- mediated conversational interaction affects usability, workload, and task performance in an environmental WebGIS for the economic valuation of forest CO2 sequestration. The existing Carta Natura application was extended with a conversational interface that maps natural-language requests to predefined tools, while spatial processing and economic valuation remain delegated to deterministic backend services shared with the graphical interface. A controlled study involved 40 participants, equally divided between those with and without prior GIS experience. Each participant performed two environmental-analysis tasks, one with each interface. Perceived usability, workload, completion time, and interaction errors were assessed using questionnaires, observations, and semi-structured interviews. Results showed that participants without prior GIS experience reported significantly higher usability, lower workload, and fewer interaction errors with the conversational interface. No significant usability or workload benefits were found among experienced participants, while completion times increased for both groups. Despite this, interviews indicated that conversational interaction was often perceived as faster and less demanding. Participants with GIS experience generally preferred the graphical interface, whereas those without prior GIS experience favored conversational access. These findings suggest that conversational interaction can improve access to existing WebGIS analytical functions for less experienced users, but does not necessarily increase task efficiency.