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Practitioner Interview

Guillermo Martinez Baquero
Interra

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**Proposed Questions for Interviews with Water Resources Engineers on
Use of Water Resources Systems Analysis in the Engineering Workplace**

Prepared by:
Technical Committee on
Excellence in Systems Analysis Teaching and Innovative Communication (ECSTATIC)
American Society of Civil Engineers (ASCE)

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Request for Determination of Non-Human Subject Research - #6063**

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Interview of Guillermo Martinez Baquero, Interra, Austin, TX, May 19, 2015

JOB BACKGROUND

1. What is your current job title?   Hydrologist

2. For how many years have you worked in your job?   4

3. What formal training have you had in systems analysis? Systems analysis, dynamical
    modeling during PhD studies

4. If your professional activities have included systems analysis, for how many years have
    you performed these activities?   4 years

QUESTIONS ABOUT USE OF SYSTEMS ANALYSIS ON THE JOB

5. Describe your job. What is/are your roles/activities in your job?

    Conduct water management studies, data analysis
    Interact with clients

6. What work projects have used systems analysis techniques to identify/evaluate/select a
    design or decision alternative?

    Modeling of reservoir systems, scenario analysis, and evaluation of alternatives to
    support confidential studies for litigation

7. What systems analysis techniques, software, and/or tools were used?

    Dynamical simulation with Stella, HEC-ResSim

Sensitivity analysis, perturbation of inputs and operating parameters

8. Have any projects coupled optimization algorithms with external simulation models, simulated system equations within the optimization framework, or used an optimization algorithm available within a simulation model? If yes, what kinds of simplifications were required in the solution approach?   No.

9. What uncertainty analyses have been used to evaluate designs or decision alternatives? If yes, what assumptions were required? What difficulties (if any) were there in communicating results of the uncertainty analysis to decision-makers?

    Sensitivity/perturbation analysis to determine which variables/controls have the largest impacts
    Scenario analysis
    No real difficulties as long as procedures and assumptions clearly explained.

10. Have projects applied multi-objective decision methods to select a final design or decision alternative? If yes, how was a preferred alternative selected from a set of tradeoffs?

    Previous projects have not reached this stage with the clients. However, as an analyst he looks at multi-use performance metrics (e.g., hydropower, environmental flows).

USE OF SYSTEMS ANALYSIS IN THE PROFESSION

11. What role should systems analysis play in professional practice? How can the profession more effectively use systems analysis in the future?

    Important for integration of issues, stakeholders' concerns – conflict resolution.

    There is a need to share knowledge across the profession and with future professionals (e.g., systematic documentation of many years of litigation studies).

    a.   What encourages or limits the use of systems analysis in the water resources engineering profession?

    Limits include political/institutional constraints and bureaucracies. Social issues may put constraints on technical solutions.

12. What systems analysis skills and techniques should universities teach to prepare new practitioners to successfully join the profession?

    Provide students with broader perspectives on aspects of problems such as multiple stakeholders, trade-offs, and the complexity of problems (and how they have evolved)
    Focus on effective communication and the ability to explain complex issues.