

Peer Review Report

Review Report on Establishing Specific Conductance–Chloride Relationships for Quaternary and Bedrock Aquifers in the Twin Cities Metropolitan Area, Minnesota, United States

Original Research, Earth Sci. Syst. Soc.

Reviewer: Walt Kelly

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Article DOI: 10.3389/esss.2023.10084

EVALUATION

Q 1 Please summarize the main findings of the study.

The authors have assessed an historical database to determine if SC measurements could be used as a proxy for chloride concentrations in aquifers in the Twin Cities, MN region, especially as chloride is increasing in groundwater due to road salt runoff. They found that for the shallowest, most vulnerable aquifers, that SC could be successfully used as a proxy. For deeper, more well protected aquifers, the relationship between SC and chloride was poor. The conclusion was the SC could be used to make inexpensive and rapid measurements for shallow aquifer systems.

Q 2 Please highlight the limitations and strengths.

Limitations: The concept is not particularly novel, having been used in many environments. There was a large gap of unavailable data (18 years).

Strengths: The most novel contribution by the authors is to consider hydrogeological factors in assessing the data, which I've only seen rarely.

Q 3 Please comment on the methods, results and data interpretation. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.

The authors used an historical dataset, they did not collect any new data. They did however combine the water quality data with well data, so they could evaluate hydrogeological factors. They used basic statistical tests, mainly regressions and box and whisker diagrams. The statistical methods, though basic, were not described particularly well.

Q 4 Check List

Is the English language of sufficient quality?

Yes.

Is the quality of the figures and tables satisfactory?

Yes.

Does the reference list cover the relevant literature adequately and in an unbiased manner?

Yes.

Are the statistical methods valid and correctly applied? (e.g. sample size, choice of test)

Yes.

If relevant, are the methods sufficiently documented to allow replication studies?

No.

Are the data underlying the study available in either the article, supplement, or deposited in a repository? (Sequence/expression data, protein/molecule characterizations, annotations, and taxonomy data are required to be deposited in public repositories prior to publication)

Yes.

Does the study adhere to ethical standards including ethics committee approval and consent procedure?

Not Applicable.

If relevant, have standard biosecurity and institutional safety procedures been adhered to?

Not Applicable.

Q 5 Please provide your detailed review report to the editor and authors (including any comments on the Q4 Check List):

Attached file

QUALITY ASSESSMENT

| | | | | | |
|---|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|
| Q 6 Originality | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q 7 Rigor | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q 8 Significance to the field | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q 9 Interest to a general audience | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q 10 Quality of the writing | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Q 11 Overall quality of the study | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |