When scientists present information to stakeholders—farmers, land managers, policymakers, or the public—they sometimes lose their audience mid-explanation. Graham McBride, a Principal Scientist focused on water quality at New Zealand’s National Institute of Water and Atmospheric Research, has been there. It often happens when scientists get into the details of statistical tests regarding their research. They describe findings in terms of $p$-values and significance. This is notoriously confusing for those who do not use those tests frequently.

For situations where stakeholder groups and scientists are working to improve something, like water quality or air quality, there may be a better way to analyze and present data that improves both the reporting of the science and how it is communicated to stakeholder groups.

McBride recently published an article in the *Journal of Environmental Quality* (https://doi.org/10.2134/jeq2018.03.0101) describing the use of trend direction assessment (TDA) rather than hypothesis testing. He is advocating for trend assessors to use TDA to provide information that is easier to interpret and communicate when determining if a situation is improving or in decline. He explains the development of this assessment procedure was inspired by a little-known paper in *Psychological Methods*, by Jones and Tukey. It was the last paper authored by Tukey, who many will

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**Trend Direction Assessment for Water Quality**

by Tracy Hmielowski

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- Trend direction assessment can be used to determine how likely it is that water quality is improving, declining, or being maintained.
- Trend direction assessment reports the likelihood of a given outcome as a percentage, as opposed to hypothesis testing for “statistical significance.”
- Communicating the likelihood of an outcome is typically easier for stakeholder groups, like policymakers and the public, to understand.