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9th International Congress on Environmental
Modelling and Software - Ft. Collins, Colorado,
USA - June 2018

Jun 27th, 2:00 PM - 3:20 PM

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Kumar, Saurav, "TRS Tool—Using data mining and natural language processing to assess the state of TMDL development" (2018). *International Congress on Environmental Modelling and Software*. 19. <https://scholarsarchive.byu.edu/iemssconference/2018/Stream-B/19>

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TRS Tool—Using Data Mining and Natural Language Processing to Assess the State of TMDL Development

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Abstract: In the United States, once a waterbody fails to meet its designated-use it is listed as impaired in the so-called 303(d)-list established by the Clean Water Act. A total maximum daily load (TMDL) is developed to remediate the water body and restore the designated use. Development of TMDL, a daily allocation of allowable pollution diet, typically involves water quality modelling to assess loads from various sources for the impairment (e.g., Nutrients, Sediments, Dissolved Oxygen). For each TMDL developed, a report is sent the United States Environmental Protection Agency (USEPA) for approval. We have developed a method based on natural language processing to analyse over 27,000 TMDL reports available from the USEPA representing over 79,000 unique TMDL developed. The analysis of the reports, from 1986 to 2017, show how water quality modelling applied for the TMDL development has evolved, the implication of policy on TMDL development, and adoption of modern techniques (e.g., remote sensing) in TMDL development. An interactive diagram that shows users the relationships between modelling techniques and impairments to assist in choosing examples reports—the TMDL Report Selection tool (TRS tool)—is available at the URL <https://occviz.com/tmdl>. In this presentation, we will discuss the method used to develop this tool and some analysis results. The objective of this exercise is to establish the current state-of-practice for TMDL development and recommend changes that may make modelling for TMDL development more robust addressing the perennial issues of lack of data in TMDL modeling.

Keywords: TMDL, water quality modelling, natural language text processing