

White Hat Bias in the Environmental Sciences

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Measures to recognize biases or conflicts of interest (COI) related to industry sources of funding are commonplace. Biases that might be related to non-industry funding sources are rarely taken into account. Biases related to factors other than funding are more difficult to detect. White Hat Bias (WHB) is defined as “bias leading to the distortion of information in the service of what may be perceived to be righteous ends.” First documented in obesity research, there is clear evidence of WHB in papers published over the past decade analyzing aspects of refined tar-based pavement sealcoat (RTS). Four types of bias were documented in the obesity research case of WHB: (1) citation bias, (2) publication bias, (3) miscommunication in press releases, and (4) inappropriate or questionable inclusion of information. These four indicators are evident in the RTS case of WHB, along with additional elements including: (a) advocacy research/confirmation bias, (b) unexplained inclusion and exclusion of data, (c) inappropriate or questionable use of guidelines or standards, (d) failure to test the null hypothesis, (e) inadequate identification or description of data or model input parameters, or (f) inadequate recognition of uncertainties. The federal government has administrative measures in place intended to prevent dissemination of unsound science, but management commitment often seems inadequate. The WHB evident in the RTS case could have come to light if peer review criteria for “highly influential” or “influential” information had been implemented. Corrections could have been made by federal agencies if initial Information Quality Act challenges were given serious consideration. Freedom of Information Act law suits could be avoided simply by making data used as the basis of scientific publications publicly available. Academic researchers who plan to build on the work of others should be confident in their understanding of foundational studies. Science journals should ensure that peer review safeguards are implemented, and should be suspicious of the concept that “science is self-correcting” when regulatory consequences are possible. The culture of organizations involved in scientific research – government, academic or industry – should embed as core principles reproducibility and the transparency required to test hypotheses.