

# *Unpacking the modelling process via sensitivity auditing*

Article

Supplemental Material

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## Useful Literature

- Review for the activity of mathematical modelling proper (Saltelli et al., 2020)[supplementary material], pp 6-8
- Review of modelling practices in environmental sciences (Badham et al., 2019; Hamilton et al., 2019; Jakeman, Letcher, & Norton, 2006; Little et al., 2019)
- Review of modelling practices in the field of infectious diseases and medical research (Behrend et al., 2020; Den Boon et al., 2019; Eddy et al., 2012)
- Challenges in socio-environmental system modelling (Elsawah et al., 2020)
- Surveys with modelling communities on the need for normative or ethical approaches versus technical ones (Eker, Rovenskaya, Obersteiner, & Langan, 2018; Padilla, Diallo, Lynch, & Gore, 2018)
- Forms of activism to scrutinise different instances of quantifications (“Algorithmic Justice League - Unmasking AI harms and biases”, n.d.; Cardiff University, 2020; Muller, 2018; O’Neil, 2016)

## References

- Algorithmic Justice League - Unmasking AI harms and biases. (n.d.). Retrieved December 29, 2021, from <https://www.ajl.org/>
- Badham, J., Elsawah, S., Guillaume, J. H., Hamilton, S. H., Hunt, R. J., Jakeman, A. J., ... Bammer, G. (2019). Effective modeling for Integrated Water Resource Management: A guide to contextual practices by phases and steps and future opportunities. *Environmental Modelling and Software*, 116, 40–56. doi:10.1016/j.envsoft.2019.02.013
- Behrend, M. R., Basáñez, M. G., Hamley, J. I., Porco, T. C., Stolk, W. A., Walker, M., & de Vlas, S. J. (2020). Modelling for policy: The five principles of the Neglected Tropical Diseases Modelling Consortium. *PLoS neglected tropical diseases*, 14(4), e0008033. doi:10.1371/journal.pntd.0008033
- Cardiff University. (2020). *Data Justice Lab*. Retrieved from <https://datajusticelab.org/>
- Den Boon, S., Jit, M., Brisson, M., Medley, G., Beutels, P., White, R., ... Hutubessy, R. (2019). Guidelines for multi-model comparisons of the impact of infectious disease interventions. *BMC Medicine*, 17(1), 163. doi:10.1186/s12916-019-1403-9
- Eddy, D. M., Hollingworth, W., Caro, J. J., Tsevat, J., McDonald, K. M., & Wong, J. B. (2012). Model transparency and validation: A report of the ISPOR-SMDM modeling good research practices task force-7. *Medical Decision Making*, 32(5), 733–743. doi:10.1177/0272989X12454579
- Eker, S., Rovenskaya, E., Obersteiner, M., & Langan, S. (2018). Practice and perspectives in the validation of resource management models. *Nature Communications*, 9(1), 5359. doi:10.1038/s41467-018-07811-9
- Elsawah, S., Filatova, T., Jakeman, A. J., Kettner, A. J., Zellner, M. L., Athanasiadis, I. N., ... Lade, S. J. (2020). Eight grand challenges in socio-environmental systems modeling. *Socio-Environmental Systems Modelling*, 2, 16226. doi:10.18174/sesmo.2020a16226
- Hamilton, S. H., Fu, B., Guillaume, J. H., Badham, J., Elsawah, S., Gober, P., ... Zare, F. (2019). A framework for characterising and evaluating the effectiveness of environmental modelling. *Environmental Modelling and Software*, 118, 83–98. doi:10.1016/j.envsoft.2019.04.008
- Jakeman, A., Letcher, R., & Norton, J. (2006). Ten iterative steps in development and evaluation of environmental models. *Environmental Modelling & Software*, 21(5), 602–614.
- Little, J. C., Hester, E. T., Elsawah, S., Filz, G. M., Sandu, A., Carey, C. C., ... Jakeman, A. J. (2019). A tiered, system-of-systems modeling framework for resolving complex socio-environmental policy issues. *Environmental Modelling and Software*, 112, 82–94. doi:10.1016/j.envsoft.2018.11.011
- Muller, J. Z. (2018). *The tyranny of metrics*. Princeton, NJ: Princeton University Press.

- O'Neil, C. (2016). *Weapons of math destruction : How big data increases inequality and threatens democracy*. Random House Publishing Group.
- Padilla, J. J., Diallo, S. Y., Lynch, C. J., & Gore, R. (2018). Observations on the practice and profession of modeling and simulation: A survey approach. *SIMULATION*, *94*(6), 493–506. doi:[10.1177/0037549717737159](https://doi.org/10.1177/0037549717737159)
- Saltelli, A., Bammer, G., Bruno, I., Charters, E., Fiore, M. D., Didier, E., . . . Vineis, P. (2020). Five ways to ensure that models serve society: A manifesto. *Nature*, *582*(7813), 482–484. tex.copyright: 2020 Nature. doi:[10.1038/d41586-020-01812-9](https://doi.org/10.1038/d41586-020-01812-9)