

EGU21-16317

<https://doi.org/10.5194/egusphere-egu21-16317>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Predicting future energy and biodiversity trade-offs globally

Sebastian Dunnett¹, Robert A Holland¹, Gail Taylor², and Felix Eigenbrod¹

¹Geography and Environmental Science, University of Southampton, Southampton, UK

²Department of Plant Sciences, UC Davis, Davis, USA

Protected areas and renewable energy generation are key tools to combat biodiversity loss and climate change respectively. Over the coming decades, very large-scale expansion of renewable energy infrastructure will be needed to meet climate change targets, while simultaneously large-scale expansion of the protected area network to meet conservation objectives is planned. However, renewable energy infrastructure has negative effects on wildlife, and co-occurrence may mean emissions targets are met at the expense of conservation objectives. However, data limitations mean that the degree of likely future conflict of these two key land management objectives has not been fully assessed. Here, we address this gap by examining current and projected future overlaps of wind and solar photovoltaic installations and important conservation areas globally using new spatially explicit wind and solar photovoltaic data, and new methods for predicting future renewable expansion. We show similar levels of co-occurrence of important conservation areas and wind and solar installations as previous studies but also show that once area is accounted for previous concerns about overlaps in Northern Hemisphere may be largely unfounded, though are high in some high-biodiversity countries (e.g. Brazil). Future projections of overlap between the two land uses are generally lower than previously predicted using new data, with regional correlation coefficients peaking at -0.3418 and 0.2053 , suggesting a low risk of future conflict. Our results show that the current and future overlap of the two land uses may not be as severe as previously suggested. This is important, as global efforts to decarbonise energy systems are central to mitigating against climate change and against the strong negative impacts of projected climate change on biodiversity.