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| **RapidFEM4D: A web-based mapping platform for assessing the impacts and near-term recovery of Hurricane Ian on forest ecosystems in Florida** |
| **Introduction/Aim:** The catastrophic effects of hurricanes on forest ecosystems underscore the need for monitoring tools that can assess and predict the ecological aftermath of such natural disasters. Hurricane Ian, which swept through Florida, left behind a trail of destruction that highlighted this need. In response, our aim was to develop and offer an open-source web-based mapping platform that provides a temporal sequence of hurricane disturbance severity and recovery maps across forested areas within hurricane Ian’s path in Florida.**Methods:** Spaceborne lidar, synthetic aperture radar, and passive optical data were used as input for a Random Forest model to quantify aboveground biomass density. This data enabled us to generate wall-to-wall maps that provided a detailed visual representation of the biomass density across the affected regions. We then conducted a thorough assessment of the pre- and post-hurricane biomass estimates to assess the severity of the damage inflicted by the hurricane Ian. Furthermore, we overlaid biomass loss maps with geographic information on Florida counties, yielding estimates of hurricane-induced biomass damage at the county level. Finally, output maps were hosted on the RapidFEM4D platform, an open-source, web-based mapping platform designed to enhance the accessibility and applicability of our research.**Results:** The RapidFEM4D, accessible via http://rapidfem4d.silvalab-uf.com/, facilitated the creation and dissemination of detailed maps that display variations in aboveground biomass density before and after the hurricane's Ian passage. Visual assessments conducted using these maps have highlighted significant changes across different forest areas and at the county level. Users can analyse specific areas of interest by utilizing the platform's tools to derive estimates of biomass loss and damage severity. This feature significantly enhances the platform's utility, as it allows for a more personalized examination of the hurricane's effects. Initial user feedback indicates that the ability to quantify damage at both a broad scale and a more granular, county-level perspective is highly valuable for targeted response and recovery planning.**Conclusion:** The RapidFEM4D stands as an important tool for stakeholders, academia, and decision-makers, in the context of hurricane impact assessment on forest ecosystems. This accessibility facilitates informed decision-making and fosters collaborative efforts towards sustainable forest management and disaster mitigation. By providing open access to crucial data and analytics, RapidFEM4D enhances our collective ability to respond to and recover from natural disasters, supporting a broad spectrum of users in developing targeted strategies for resilience and conservation. |

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