This web application is designed to help users explore (1) the importance of marine fisheries to human nutrition, (2) the projected impacts of climate change on the nutrient endowment of marine fisheries, and (3) the opportunities for fisheries management reforms to mitigate impacts of climate change on food and nutrition from marine seafood. Data are presented at the national scale to allow users to assess vulnerability, sensitivity, and adaptive capacity in their country.

The web application is organized into the following four panels:

1. **Fish nutrition data:** This page allows the user to explore the nutrient content of more than 7,000 finfish species using data from Vaitla et al. (2018). This allows the user to anticipate the nutritional consequences of (1) losing or gaining access to a stock through shifts in productivity or distribution, (2) increasing long-term yields through management reforms, or (3) retaining the stock for domestic consumption rather than export.
2. **National nutrition data:** This page allows the user to assess the current and historical daily per capita intake of 23 nutrients in 173 countries and the contribution of marine fish and invertebrates to this intake using the [GENuS database](https://dataverse.harvard.edu/dataverse.xhtml?alias=GENuS) (Smith et al. 2016). By illustrating the current nutritional health of countries and their reliance on marine seafood as a source of nutrition, this page allows the user to anticipate the vulnerability or resilience of countries to climate-driven changes in nutrients from fisheries. Importantly, it highlights nutritional gaps that might be worsened by climate change and must be closed through focused fisheries reforms, the expansion of other food sectors, or trade.
3. **National fisheries and nutrition forecasts:** This page allows the user to explore the projected impacts of climate change on national fisheries with and without adaptive fisheries reforms and thus the consequences of climate change and fisheries adaptation on national nutrition endowments from marine fisheries. These projections are powered by combining the fisheries projections of Free et al. (2020) with the nutrient content estimates of Smith et al. (2016) and Vaitla et al. (2018). This page allows the user to anticipate the extent to which fisheries reforms could be leveraged to fill nutritional gaps under climate change or the extent to which other food sectors or trade will have to fill nutritional gaps left or unfilled by declining fisheries.
4. **National report card:** This page summarizes the vulnerability of a nations food systems to climate change through the exposure, sensitivity, and adaptive capacity framework. The sensitivity is defined by level of nutritional health and reliance on fisheries. Exposure is defined by the projected rate of change in underlying nutrient availability and adaptive capacity is defined by the degree to which these impacts could be offset through reforms.

This web application is powered by data from the following three papers:

Smith MR, Micha R, Golden CD, Mozaffarian D, Myers SS (2016) Global Expanded Nutrient Supply (GENuS) model: a new method for estimating the global dietary supply of nutrients. *PLoS One* 11(1): e0146976. <https://doi.org/10.1371/journal.pone.0146976>

Vaitla B, Collar D, Smith MR, Myers SS, Rice BL, Golden CD (2018) Predicting nutrient content of ray-finned fishes using phylogenetic information. *Nature Communications* 9(3742).<https://doi.org/10.1038/s41467-018-06199-w>

Free CM, Mangin T, García Molinos J, Ojea E, Burden M, Costello C, Gaines SD (2020) Realistic fisheries management reforms could mitigate the impacts of climate change in most countries. *PLoS One* 15(3): e0224347. <https://doi.org/10.1371/journal.pone.0224347>

Please cite the original papers when referring to their data and in any other appropriate circumstance. When referencing the web application, we recommend the following citation:

Free CM et al. (2020) Nutrition, fisheries, and climate change web explorer. Available online at:<https://cfree.shinyapps.io/nutricast/>

The development of this web application was funded by the Environmental Defense Fund. All code and data for the application is available on GitHub [here](https://github.com/cfree14/nutrient_endowment).