

EGU21-13126

<https://doi.org/10.5194/egusphere-egu21-13126>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Probability Assessments of an Ice-Free Arctic: Comparing Statistical and Climate Model Projections

Glenn Rudebusch¹ and Francis Diebold²

¹Federal Reserve Bank of San Francisco, Research, United States of America (glenn.rudebusch@sf.frb.org)

²University of Pennsylvania

Based on several decades of satellite data, we provide statistical forecasts of Arctic sea ice extent during the rest of this century. The best fitting statistical model indicates that overall sea ice coverage is declining at an increasing rate. By contrast, average projections from the CMIP5 global climate models foresee a gradual slowing of Arctic sea ice loss even in scenarios with high amounts of carbon emissions. Our long-range statistical projections also deliver *probability* assessments of the timing of an ice-free Arctic. These results indicate almost a 60 percent chance of an effectively ice-free Arctic Ocean sometime during the 2030s—much earlier than the average projection from the global climate models. Our results are also consistent with projections from bivariate regressions of sea ice extent and carbon emissions.