**Table 2. Projected relative contribution of scenarios of no-take marine protected areas coverage, fishing levels and climate change to biomass rebuilding estimated from the mixed-effect models.** Level of climate change is expressed in global warming level (GWL, average surface atmospheric temperature) relative to preindustrial levels. The effects of protected area coverage by region was analyzed relative to the 5% coverage scenarioa.

|  |  |  |
| --- | --- | --- |
|  | **Effects of no-take MPAs on B/ BMSY (% change)** +/- standard error | |
| **Variables** | **Modelb: Area protected by region** | **Modelc: Area protected by stock** |
| Area protected  (F/FMSY = 1.0 & GWL = 0 oC) | 2.5 +/-0.5  (MPA=15%) | 3.4 +/-0.2 per 10% of stock area protected |
| 5.4 +/-0.4  (MPA=30%) |
| Global warming level  (No-take MPAs coverage = 5%) | -9.6 +/-0.3 oC-1  (F/FMSY=1.0) | -9.9 +/-0.3 oC-1  (F/FMSY=1.0) |
| -14.7 +/-0.6 oC-1  (F/FMSY=0.5) | -15.1 +/-0.7 oC-1  (F/FMSY=0.5) |
| -12.6 +/-0.7 oC-1  (F/FMSY=0.75) | -13.0 +/-0.7 oC-1  (F/FMSY=0.75) |
| -4.7 +/-0.6 oC-1  (F/FMSY=1.5) | -4.7 +/-0.7 oC-1  (F/FMSY=1.5) |
| Fishing level  (No-take MPAs coverage = 5% & GWL = 0 oC) | 58.3 +/-0.7  (F/FMSY = 0.5) | 59.3 +/-0.7  (F/FMSY = 0.5) |
| 29.2 +/-0.7  (F/FMSY = 0.75) | 29.9 +/-0.7  (F/FMSY = 0.75) |
| -55.6 +/-0.7  (F/FMSY = 1.5) | -56.6 +/-0.7  (F/FMSY = 1.5) |

a. For example, fishing at half of FMSY was projected to increase biomass by 58.3 +/-0.7% relative to biomass at MSY, but global warming at 1 oC relative to preindustrial levels would lower the biomass increase by 14.7 +/-0.6%. At no-take coverage of 15%, biomass would increase by 2.5 +/-0.5% relative to the baseline 5% coverage scenario.

b. Results from the mixed-effect model (Model 4): Biomass~factor(F/FMSY)\*GWL+factor(MPA) + GWL + (1|stock), where MPA and GWL refers to coverage of no-take MPAs over the Northeast Atlantic and global warming level, respectively while stock identities (stock) are considered random effect. c. Results from the mixed-effect model (Model 4) with no-take MPAs coverage estimated over specific stock range size.