

### **Appendix 3.** Measuring the fisheries instability indicator.

This indicator was based on resilience levels of an ecosystem function to environmental perturbations (see Oliver *et al.* 2015). In the context used here, we referred to the tendency of fisheries provision to remain stable in the face of some perturbation and rapidly return to pre-perturbation levels. This instability was estimated to be the total deficit of the ecosystem function in time. To measure this deficit, we calculated the annual instability by attributing one point for each year that catch data were provided below the minimum threshold (inferior quantile of the time series), plus the difference between the minimum threshold and annual catch, as follows:

$$\text{Annual Instability} = 1 + (\text{minimum threshold} - \text{annual catch})$$

The minimum threshold represents a measure of resistance of ecosystem function to perturbation, while the annual catch represents a recovery measure (Oliver *et al.* 2015). Annual instability values were calculated for time series and averaged for each coastal state. We used Z-transformations for both data normalization and to reduce the variability among states (Zuur *et al.* 2010).

### REFERENCES

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- Zuur, A. F., Ieno, E. N., and C. S. Elphick. 2010. A protocol for data exploration to avoid common statistical problems. *Methods in ecology and evolution*, 1(1), 3-14.