

# Fisheries Policy and Governance Analysis User Guide

*Beta version – May 2018*

## TOOL DEVELOPERS

Willow Battista, Alexis N. Rife, Monica Goldberg, Jake Kritzer and Matt Tinning

## CONTRIBUTORS

An earlier version of this tool was originally developed by Mohammed Aatish Khan and Ariana Spawn, Masters students in the Yale Environmental Protection Clinic, under the guidance of Alexis Rife and Jake Kritzer.

## VERSION

This tool is being released as a beta version that will be updated as we receive feedback from fishery practitioners. The beta designation is a recognition of the value of stakeholder input, which we know will make this tool even more successful in supporting sustainable fisheries management around the world. We invite you to share your feedback on the Sustainable Fisheries Toolkit website.

## TOOL COMPONENTS

User Guide

Excel Tool

*Any views expressed in this tool and associated materials are those of the authors and do not necessarily represent those of the contributors or their organizations. Any errors are those of the authors. This tool and any supporting materials are decision-support tools and results should be interpreted as such. Neither EDF, nor the authors, take responsibility for any outcomes that result from the use of this tool.*

Copyright © 2018 Environmental Defense Fund. All rights reserved.

Battista, W., Rife, A. N., Goldberg, M., Kritzer, J. and Tinning, M. (2018). *Fisheries Policy and Governance Analysis*. Environmental Defense Fund.

**TABLE OF CONTENTS**

---

- BACKGROUND** ..... 3
  - Intended audience ..... 3
  - When to use this tool ..... 3
  - Limitations..... 3
- INSTRUCTIONS** ..... 4
  - Getting started ..... 4
  - Before you begin..... 5
  - Step 1: Define scope..... 5
  - Step 2: Score each attribute..... 5
  - Step 3: Review results ..... 6
  - Step 4: Interpret and reflect upon results ..... 6
  - Step 5 (optional): Create schematic of governance system..... 7
  - Step 6 (optional): Hire local experts for additional questions ..... 8
- GLOSSARY** ..... 9
- REFERENCES**.....11

## BACKGROUND

---

Governance consists of the institutions, processes, roles, responsibilities and resources that collectively determine how societal goals are met. Policy consists of laws, treaties, regulations and other instruments that create and limit the power of institutions to achieve objectives, including by defining processes and establishing rights. Strong and well-designed fisheries law and policy and an effective governance system are critical components for ensuring the durability of a sustainable and effective fisheries management system.

### Purpose of this tool

The Fisheries Policy and Governance Analysis is used to evaluate the presence, absence and completeness of key policy and governance attributes in a fishery system. The analysis allows the user to diagnose the weaknesses of the existing fisheries law and governance system that might create barriers to effective management and reform. Fishery reform projects can then be designed to account for these gaps and weaknesses, or, where possible, they can be addressed directly during the implementation of a project.

### Intended audience

The Fisheries Policy and Governance Analysis is meant to be used by fishery managers, non-governmental organizations (NGOs) and other practitioners to understand the policy and governance landscape of a fishery system. An analysis performed with the tool can help inform policy reform strategies or highlight areas where governance systems and institutions can be strengthened.

### When to use this tool

The tool can be used at various stages of the fisheries reform and management process. During the Strategic Scoping phase of the fishery reform process, it may be helpful to use this tool to initially analyze the highest relevant level of governance, such as at the national or international level, to identify major challenges or gaps in the governance system that will need to be addressed in order to facilitate fishery reforms. The tool can also be used at a regional or local level to evaluate the presence or absence of key attributes at the fishery scale during the Assessment and Evaluation phase of a project. See the Sustainable Fisheries Toolkit website for more information on the phases of a fishery reform process.

The Fisheries Policy and Governance Analysis is designed to be completed in a half day or less. However, this estimate varies greatly based on the user's knowledge of the governance and policies of the fishery system being analyzed. If additional research is required to score the fishery system, additional time may be needed to complete the tool.

The tool can be completed by conducting desk research, reviewing existing laws and regulations and interviewing local experts. It is meant to be a starting point to understanding the gaps and enabling conditions of the governance system in a given country or region.

### Limitations

The tool is based on research and literature conducted on key attributes which enable and contribute to successful fisheries management and governance. As such, it is inclusive and many systems will not meet all attributes. However, it will guide users to important gaps or areas of

underperformance that may affect implementation and which may need to be addressed in order to ensure the durability of sustainable management.

In addition, the differing number of Attributes within each Category may emphasize some Attributes over others. In other words, in Categories that are made up of fewer Attributes, each individual Attribute score will have a greater relative impact on the overarching Category's score than in Categories made up of a great number of Attributes. This is something users of the tool should be aware of as they interpret the results of their analysis (see below).

The accuracy of the results also depends on the expertise and knowledge of those completing the tool. We highly recommend that users consult with multiple system experts when scoring the attributes in this tool, and seek to corroborate scores with multiple sources whenever possible.

## INSTRUCTIONS

---

### Getting started

This User Guide is designed to walk you through the Fisheries Policy and Governance Analysis. The Tool is a Microsoft Excel workbook divided into multiple tables: (1) Overview, (2) Instructions, (3) Policy and Governance Analysis, (4) Results and (5) Numbered References. The first two tabs provide a brief introduction and a summary of the instructions found in this User Guide, for easy reference. The third tab contains the Tool itself—this is where you will score each of the attributes that contribute to an effective governance and policy system. The fourth tab will capture the results of your analysis. The fifth and final tab includes supporting references that were used to develop the Tool, which may be useful if you want to conduct further research.

To begin, **open the Fisheries Policy and Governance Analysis Excel file**, which will open on the Overview tab.

Navigate to the Policy and Governance tab. Orient yourself to the tool: Column B contains the eight **Categories**, Column C contains the **Category Definitions** and Column D contains the individual **Attributes** that make up each category.

The eight Categories are used to organize and classify individual attributes that influence the efficacy of a governance and policy system. These eight categories are:

- Accountable and Transparent
- Adequate and Effective Monitoring and Enforcement Authority
- Adequate Regulatory Authority
- Clear Rules Defining Objectives and Directives, Decision-making and Deliberation
- Clear Standards for Protecting Marine Ecosystems and Science-Based Management
- Facilitates and Protects Stakeholder Participation
- Facilitates Secure Fishing Rights
- Operates at Appropriate Scale

Within each of these Categories are a set of more precise Attributes, each of which captures a specific component of the system. Users will score each of these Attributes (following the process described in this User Guide), generating the overarching scores for each Category, which can be found on the Results tab.

Also note that beneath the main results on the Results tab there is a box containing results for **Governance System Components**. These components are defined in the Glossary in this User Guide and represent an alternative way of organizing and thinking about a governance system, based on the traditional branches of government.

### Before you begin

To determine appropriate scores for Attributes, we recommend thoroughly reviewing fisheries laws and any related environmental laws that may inform decision-making processes or other aspects of your governance system. It is also helpful to conduct a literature review to find information on the performance and degree of implementation of various aspects of the governance system. For some Attributes, it is also helpful to speak with local experts on fishery laws and governance within your country or fishery. This may include law professors, lawyers at NGOs, or others. Additionally, fisheries managers or other government officials and fishermen themselves can be consulted to provide additional insights.

### Step 1: Define scope

The first step is to define the scope of the system you will be examining. Use the space in cell B6 in the Policy and Governance Analysis tab to answer the following questions and define your scope.

- a. Spatial: What regions, agencies, fisheries, communities, etc. do you consider to be a part of your governance and policy system? Is this analysis for the national level system or for a local/regional system?
- b. Temporal: Are you going to score your system based on past performance (i.e., based on data or information about outcomes under current or past regulations), or future expectations (e.g., how recent policy changes are expected to impact system components)?

### Step 2: Score each attribute

Start with the first Category (Accountable and Transparent) in Column B. Read through the Category and Category Definition provided. Then, review each Attribute in Column G and score each Attribute. You will assign a score using the following scale:

- 0 = Attribute not present in system;
- 1 = EITHER Attribute present "on paper" (i.e., formally ratified or sanctioned) but not manifesting in practice OR Attribute manifesting through informal agreements or agency/individual efforts but not formally ratified and supported;
- 2 = Attribute present on paper and manifesting in practice, but incomplete or not fully effective for any reason;
- 3 = Attribute fully realized in system—both formally ratified on paper and fully effective in practice.

In order to score each attribute:

- a. Review the attribute as defined in Column G.
- b. Select the score from the dropdown in Column I, following the Scoring Methodology in cell I3.
- c. Record the relevant regulatory reference (i.e., statute, section, etc.) for each Attribute where this is appropriate in Column K.

- d. Include any additional notes on your scoring rational in Column L that might be valuable later on when interpreting outcomes.

Repeat this process, moving down through the Categories, until all Attributes have been scored.

Alternatively, you can choose to begin with any Category that seems most appropriate or relevant to your system and score the remaining Categories in the order of your choosing.

### Step 3: Review results

Once all Attributes have been scored, go to the Results tab and review the results. The tool will automatically generate a summary score for each Category, based on scores for each contributing Attribute. Below the Category scores are the summary scores for each Governance System Component.

These summary scores for the overarching Categories and Components are intended to provide users with guidance as to which elements of their systems are fully realized, covered fully on paper and implemented in practice. The scores (which are percentages, ranging from 0-100%) are color coded (red-yellow-green)—see Figure 1 below for interpretation. Examine these summary scores to identify gaps in your governance and policy system that might undermine management efficacy and lead to negative outcomes.

**Figure 1** | Fishery Policy and Governance Analysis scoring interpretation

Percent Complete	Color	Interpretation
100-80		Strong performance
80-60		Some gaps and areas for improvement
60-40		Many gaps to be addressed and improved
40-20		Significant challenges and gaps to be addressed
20-0		Many and critical gaps to be addressed

These color codes provide a visual guide to help users quickly understand how to interpret their scores. However, users should determine the actual threshold levels that require attention in each Category. A qualitative examination and review of the system as a whole is critical. This quantitative analysis is meant to highlight gaps and areas of underperformance for further analysis.

### Step 4: Interpret and reflect upon results

For each Category, and in particular if the score is yellow, orange or red, consider revisiting the Policy and Governance Analysis tab to explore which Attributes are driving these scores. To interpret and reflect upon each Attribute:

- a. In the Policy and Governance Analysis tab, examine the Attributes to determine which specific system elements and features might benefit from attention. After reviewing the Attributes, identify which are performing well and which are underperforming. Think through some next steps to address current challenges.

- b. Write down your findings in Columns F-H in the Results tab. For example, some improvements may be accomplished through actual adjustments or changes to the governance and policy system (e.g., changing a law, strengthening enforcement authority, etc.). Alternatively, some gaps may need to be addressed through elements of the fishery management design itself (e.g., building a community monitoring system into the fishery management plan to reduce gaps in formal systems to incorporate science and management).

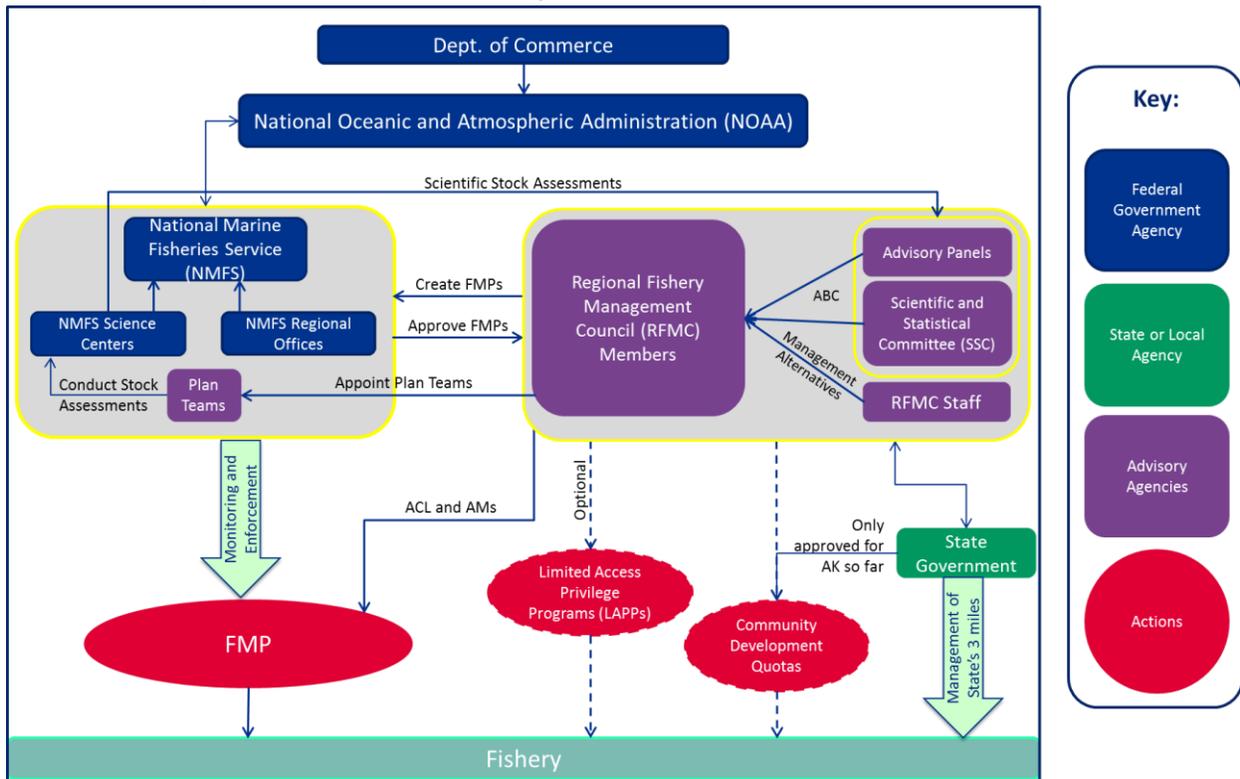
In an effective governance system, the Governance System Components (Administrative/Executive, Legislative and Judicial), should work together to ensure responsibilities are fulfilled and stakeholder rights are protected. On the Result tab, each of the Governance System Components receives a score, based on Attributes associated with those systems. These scores can be used to inform actions and decisions to improve management outcomes in a given system. Low scores on any of these Components can be seen as an indication of overall system weakness, so these results can guide users toward the appropriate area to target reform efforts.

Generally, this analysis process can be thought of as a barriers and strengths analysis—those Categories and Components where gaps exist might be creating barriers to effective system governance, which may in turn undermine management efforts. Conversely, those Categories and Components that get the highest scores—indicating that they are completely (or nearly completely) realized in the system—may be areas of strength that could be drawn on (or may already be acting) to fill gaps in other areas.

### **Step 5 (optional): Create schematic of governance system**

It may be useful to create a map of the governance system operating in your country, region or fishery. Start with the EDF's Fishery Systems Mapping Tool to identify the high-level entities, individuals, agencies and organizations that play important roles. You can download the Fishery Systems Mapping Tool on the Sustainable Fisheries Toolkit website. You may then outline these components in more detail, including laws and other responsibilities. See Figure 2 for an example of a completed schematic of the Governance System.

**Figure 2** | Formal national, regional and state governance network of the U.S. Magnuson-Stevens Fishery Conservation and Management Act (Battista et al., in review).



**Step 6 (optional): Hire local experts for additional questions**

In addition to using this tool to gain a big-picture look at the functioning of the governance system, it is often helpful for fishery practitioners to conduct further in-depth analyses around specific governance-related questions, analyzed by a local policy expert and/or consultant.

## GLOSSARY

---

### Categories of Governance and Policy System

**Accountable and Transparent** – Systems exist to hold institutions accountable for their actions and decisions, act based on relevant and accurate information that's accessible to the public, with minimal politicization. Systems exist to address corruption, should it arise.

**Adequate and Effective Monitoring and Enforcement Authority** – Systems are in place to identify rule violations, with reliable and effective enforcement and prosecutorial processes.

**Adequate Regulatory Authority** – Management authorities have power to develop, adopt and implement rules necessary to successfully manage the resource, and to evaluate the efficacy of those decisions and adjust them over time. Regulatory authority is sufficiently stable and adequately and reliably funded to facilitate management success.

**Clear Rules Defining Objectives and Directives, Decision-making, and Deliberation** – Management Authorities are guided by common, overarching principles and goals, with clear and transparent standards by which decisions will be made.

**Clear Standards for Protecting Marine Ecosystems and Science-Based Management** – Mechanisms and policies are in place that enable and facilitate the conservation of resources, marine habitats and ecosystems, ensuring that management decisions are made based on the best available scientific information to meet goals.

**Facilitates and Protects Stakeholder Participation** – Mechanisms are in place that ensure stakeholders can meaningfully participate throughout decision-making and management processes and that all individuals impacted by management decisions are represented fairly and equitably.

**Facilitates Secure Fishing Rights** – Systems are in place which ensure an appropriate distribution of rights and responsibilities, and which enable effective management utilizing secure fishing rights.

**Operates at Appropriate Scale** – Scale of governing institutions, as well as resource management rules, are congruent with the scale of the social and biophysical systems being governed.

### Governance System Component

**Administrative/Executive** – Encompasses attributes that refer to efforts to implement the regulations and laws, including through the provision of management resources, as well as the formal and informal arrangements and frameworks within which they are created and implemented.

**Legislative** – Encompasses attributes that refer to the official language of the regulations and laws, as well as the agencies and bodies responsible for creating them.

**Judicial** – Encompasses attributes that refer to the enforcement of regulations and laws, the prosecution of violators and the systems available for users and stakeholders to take legal recourse to ensure authorities are fulfilling their responsibilities.

## REFERENCES

---

- Anderson, J. L., Anderson, C. M., Chu, J., Meredith, J., Asche, F., Sylvia, G., Smith, M. D., Anggraeni, D., Arthur, R., Guttormsen, A. and McCluney, J. K. (2015). The fishery performance indicators: a management tool for triple bottom line outcomes. *PLoS One*, 10(5), p.e0122809.
- Baland, J. M. and Platteau, J. P. (1996). *Halting Degradation of Natural Resources: Is There a Role for Rural Communities?* Food and Agriculture Organization of the United Nations.
- Basurto, X. and Ostrom, E. (2009). *Beyond the Tragedy of the Commons*. Economia Delle Fonti Di Energia E Dell'ambiente.
- Battista, W., Kelly, R. P., Erickson, A. and Fujita, R. (in review). Fisheries governance impacting conservation outcomes in the United States and European Union. *Coastal Management*.
- Beddington, J. R., Agnew, D. J. and Clark, C. W. (2007). Current problems in the management of marine fisheries. *Science*, 316(5832), 1713-1716.
- Beets, J. and Friedlander, A. M. (1998). Evaluation of a conservation strategy: a spawning aggregation closure for red hind, *Epinephelus guttatus*, in the U.S. Virgin Islands. *Environmental Biology of Fish*, 55, 91-98.
- Berkeley, S. A., Hixon, M. A., Larson, R. J. and Love, M. S. (2004). Fisheries sustainability via protection of age structure and spatial distribution of fish populations. *Fisheries*, 29(8), 23-32.
- Bonzon, K., McIlwain, K., Strauss, C. K. and Van Leuvan, T. (2013). *Catch Share Design Manual, Volume 1: A Guide for Managers and Fishermen (2nd ed.)*. Environmental Defense Fund.
- Branch, T. A., Hilborn, R., Haynie, A. C., Fay, G., Flynn, L., Griffiths, J., Marshall, K. N., Randall, J. K., Scheuerell, J. M., Ward, E. J. and Young, M. (2006). Fleet dynamics and fishermen behavior: lessons for fisheries managers. *Canadian Journal of Fisheries and Aquatic Sciences*, 63(7), 1647-1668.
- Branch, T. A. (2009). How do individual transferable quotas affect marine ecosystems? *Fish and Fisheries*, 10(1), 39-57.
- Campbell, B. M., Sayer, J. A. and Walker, B. (2010). Navigating trade-offs: working for conservation and development outcomes. *Ecology and Society*, 15(2), 16.
- Catchpole, T. L., Frid, C. L. J. and Gray, T. S. (2005). Discards in North Sea fisheries: causes, consequences and solutions. *Marine Policy*, 29(5), 421-430.
- Campbell, B. M., Sayer, J. A. and Walker, B. (2010). Navigating trade-offs: working for conservation and development outcomes. *Ecology and Society*, 15(2), 16.

- Cinner, J. E., Basurto, X., Fidelman, P., Kuange, J., Lahari, R. and Mukminin, A. (2012). Institutional designs of customary fisheries management arrangements in Indonesia, Papua New Guinea, and Mexico. *Marine Policy*, 36(1), 278-285.
- Cinner, J. E., McClanahan, T. R., MacNeil, M. A., Graham, N. A., Daw, T. M., Mukminin, A., Feary, D. A., Rabearisoa, A. L., Wamukota, A., Jiddawi, N. and Campbell, S. J. (2012). Comanagement of coral reef social-ecological systems. *Proceedings of the National Academy of Sciences*, 109(14), 5219-5222.
- Costello, C., Gaines, S. D. and Lynham, J. (2008). Can catch shares prevent fisheries collapse? *Science*, 321(5896), 1678-1681.
- Crowder, L. and Norse, E. (2008). Essential ecological insights for marine ecosystem-based management and marine spatial planning. *Marine Policy*, 32(5), 772-778.
- Darcy, G. H. and Matlock, G. C. (1999). Application of the precautionary approach in the national standard guidelines for conservation and management of fisheries in the United States. *ICES Journal of Marine Science*, 56(6), 853-859.
- De Bruyn, P., Murua, H. and Aranda, M. (2013). The precautionary approach to fisheries management: How this is taken into account by tuna regional fisheries management organisations (RFMOs). *Marine Policy*, 38, 397-406.
- Douvere, F. (2008). The importance of marine spatial planning in advancing ecosystem-based sea use management. *Marine Policy*, 32, 762-771.
- Folke, C., Hahn, T., Olsson, P. and Norberg, J. (2005). Adaptive governance of social-ecological systems. *Annual Review of Environment and Resources*, 30(1), 441-73.
- Food and Agriculture Organization of the United Nations (FAO) (1995). *Code of Conduct for Responsible Fisheries*. Rome.
- Fujita, R. M., Honey, K. T., Morris, A., Wilson, J. R. and Russell, H. (2010). Cooperative strategies in fisheries management: integrating across scales. *Bulletin of Marine Science*, 86(2), 251-271.
- Fung, A. (2003). Survey article: recipes for public spheres: eight institutional design choices and their consequences. *Journal of Political Philosophy*, 11(3), 338-367.
- Gell, F. R. and Roberts, C. M. (2003). Benefits beyond boundaries: the fishery effects of marine reserves. *Trends in Ecology & Evolution*, 18(9), 448-455.
- Goodin, R. E. (Ed.) (1998). *The Theory of Institutional Design*. Cambridge University Press.
- Grafton, R. Q., Arnason, R., Bjørndal, T., Campbell, D., Campbell, H. F., Clark, C. W., Connor, R., Dupont, D. P., Hannesson, R., Hilborn, R. and Kirkley, J. E. (2006). Incentive-based approaches to sustainable fisheries. *Canadian Journal of Fisheries and Aquatic Sciences*, 63(3), 699-710.

- Graham, N., Ferro, R. S., Karp, W. A. and MacMullen, P. (2007). Fishing practice, gear design, and the ecosystem approach—three case studies demonstrating the effect of management strategy on gear selectivity and discards. *ICES Journal of Marine Science*, 64(4), 744-750.
- Gutiérrez, N. L., Hilborn, R. and Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature*, 470(7334), 386-389.
- Gwinn, D. C., Allen, M. S., Johnston, F. D., Brown, P., Todd, C. R. and Arlinghaus, R. (2015). Rethinking length-based fisheries regulations: the value of protecting old and large fish with harvest slots. *Fish and Fisheries*, 16(2), 259-281.
- Hall, S. J. and Mainprize, B. M. (2005). Managing by-catch and discards: how much progress are we making and how can we do better? *Fish and Fisheries*, 6(2), 134-155.
- Halpern, B. S. (2003). The impact of marine reserves: do reserves work and does reserve size matter? *Ecological Applications*, S117-S137.
- Halpern, B. S., Lester, S. E. and Kellner, J. B. (2009). Spillover from marine reserves and the replenishment of fished stocks. *Environmental Conservation*, 36(4), 268-276.
- Hentrich, S. and Salomon, M. (2006). Flexible management of fishing rights and a sustainable fisheries industry in Europe. *Marine Policy*, 30(6), 712-720.
- Hilborn, R., Orensanz, J. L. and Parma, A. M. (2005). Institutions, incentives and the future of fisheries. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 360(1453), 47-57.
- Hilborn, R. (2007). Moving to sustainability by learning from successful fisheries. *AMBIO: A Journal of the Human Environment*, 36(4), 296-303.
- Holmes, L., Strauss, C. K., de Vos, K. and Bonzon, K. (2014). *Towards investment in sustainable fisheries: A framework for financing the transition*. Environmental Defense Fund and The Prince of Wales's International Sustainability Unit.
- Jentoft, S. and McCay, B. (1995). User participation in fisheries management: lessons drawn from international experiences. *Marine Policy*, 19(3), 227-246.
- Jentoft, S. and Bavinck, M. (2014). Interactive governance for sustainable fisheries: dealing with legal pluralism. *Current Opinion in Environmental Sustainability*, 11, 71-77.
- Kaczynski, V. M. and Fluharty, D. L. (2002). European policies in West Africa: who benefits from fisheries agreements? *Marine Policy*, 26(2), 75-93.
- Lebel, L., Anderies, J., Campbell, B., Folke, C., Hatfield-Dodds, S., Hughes, T. and Wilson, J. (2006). Governance and the capacity to manage resilience in regional social-ecological systems. *Ecology and Society*, 11(1), 19.

- Lester, S. E., Halpern, B. S., Grorud-Colvert, K., Lubchenco, J., Ruttenberg, B. I., Gaines, S. D., Aíramé, S. and Warner, R. R. (2009). Biological effects within no-take marine reserves: a global synthesis. *Marine Ecology Progress Series*, 384, 33-46.
- Liu, O. R., Thomas, L. R., Clemence, M., Fujita, R., Kritzer, J. P., McDonald, G. and Szuwalski, C. (2016). An evaluation of harvest control methods for fishery management. *Reviews in Fisheries Science & Aquaculture*, 24(3), 244-263.
- McClanahan, T. R., Verheij, E. and Maina, J. (2006). Comparing the management effectiveness of a marine park and a multiple-use collaborative fisheries management area in East Africa. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 16(2), 147-165.
- McClanahan, T. R., Graham, N. A., MacNeil, M. A., Muthiga, N. A., Cinner, J. E., Bruggemann, J. H. and Wilson, S. K. (2011). Critical thresholds and tangible targets for ecosystem-based management of coral reef fisheries. *Proceedings of the National Academy of Sciences*, 108(41), 17230-17233.
- Mora, C., Myers, R. A., Coll, M., Libralato, S., Pitcher, T. J., Sumaila, R. U., Zeller, D., Watson, R., Gaston, K. J. and Worm, B. (2009). Management effectiveness of the world's marine fisheries. *PLoS Biology*, 7(6), p.e1000131.
- O'Keefe, C. E., Cadrin, S. X. and Stokesbury, K. D. (2013). Evaluating effectiveness of time/area closures, quotas/caps, and fleet communications to reduce fisheries bycatch. *ICES Journal of Marine Science*, 71(5), 1286-1297.
- Olsson, P., Folke, C. and Berkes, F. (2004). Adaptive comanagement for building resilience in social-ecological systems. *Environmental management*, 34(1), 75-90.
- Ostrom, E. and Schlager, E. (1996). The Formation of Property Rights. In Hanna, S., Folke, C. and Maler, K. G. (Eds.) *Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment*. Island Press.
- Parlee, C. E. and Wiber, M. G. (2014). Institutional innovation in fisheries governance: adaptive co-management in situations of legal pluralism. *Current Opinion in Environmental Sustainability*, 11, 48-54.
- Pikitch, E., Santora, C., Babcock, E. A., Bakun, A., Bonfil, R., Conover, D. O., Dayton, P. A. O., Doukakis, P., Fluharty, D., Heneman, B. and Houde, E. D. (2004). Ecosystem-based fishery management. *Science*, 305(5682), 346-347.
- Pitcher, T. J., Kalikoski, D., Short, K., Varkey, D. and Pramod, G. (2009). An evaluation of progress in implementing ecosystem-based management of fisheries in 33 countries. *Marine Policy*, 33(2), 223-232.
- Purcell, S. W., Mercier, A., Conand, C., Hamel, J. F., Toral-Granda, M. V., Lovatelli, A. and Uthicke, S. (2013). Sea cucumber fisheries: global analysis of stocks, management measures and drivers of overfishing. *Fish and Fisheries*, 14(1), 34-59.

- Reed, M. S. (2008). Stakeholder participation for environmental management: a literature review. *Biological Conservation*, 141(10), 2417-2431.
- Shepherd, J. G. (2003). Fishing effort control: could it work under the common fisheries policy? *Fisheries Research*, 63(2), 149-153.
- Sivas, D. A. and Caldwell, M. R. (2008). A new vision for California ocean governance: comprehensive ecosystem-based marine zoning. *Stanford Environmental Law Journal*, 27, 209.
- Turner, S. J., Thrush, S. F., Hewitt, J. E., Cummings, V. J. and Funnell, G. (1999). Fishing impacts and the degradation or loss of habitat structure. *Fisheries Management and Ecology*, 6(5), 401-420.
- Wade, R. (1988). The management of irrigation systems: How to evoke trust and avoid prisoner's dilemma. *World Development*, 16(4), 489-500.
- Wielgus, J., Poon, S., del Río, E. C., Muñoz, D., Whittle, D. and Fujita, R. (2014). Fishery cooperatives in Cuba: Potential benefits, legal feasibility, and governance pre-conditions. *Marine Policy*, 45, 128-137.
- Worm, B., Hilborn, R., Baum, J. K., Branch, T. A., Collie, J. S., Costello, C., Fogarty, M. J., Fulton, E. A., Hutchings, J. A., Jennings, S. and Jensen, O. P. (2009). Rebuilding global fisheries. *Science*, 325(5940), 578-585.