

Azuz-Adeath *et al.* (2015) - Design and evaluation of marine and coastal governance indicators for the Southern Mexican region. *Journal of Integrated Coastal Zone Management / Revista de Gestão Costeira Integrada*, 15(3):333-351. DOI: 10.5894/rgci578 Supporting Information

Supporting Information

Figure SI.1 - Results of sensitivity analysis performed for several aggregation and weighting methods (LIN=linear, GEOM=geometric, PCA=principal component analysis) and sets of indicators exclusion (OBJ 1 to OBJ 14=removed sets of objectives).

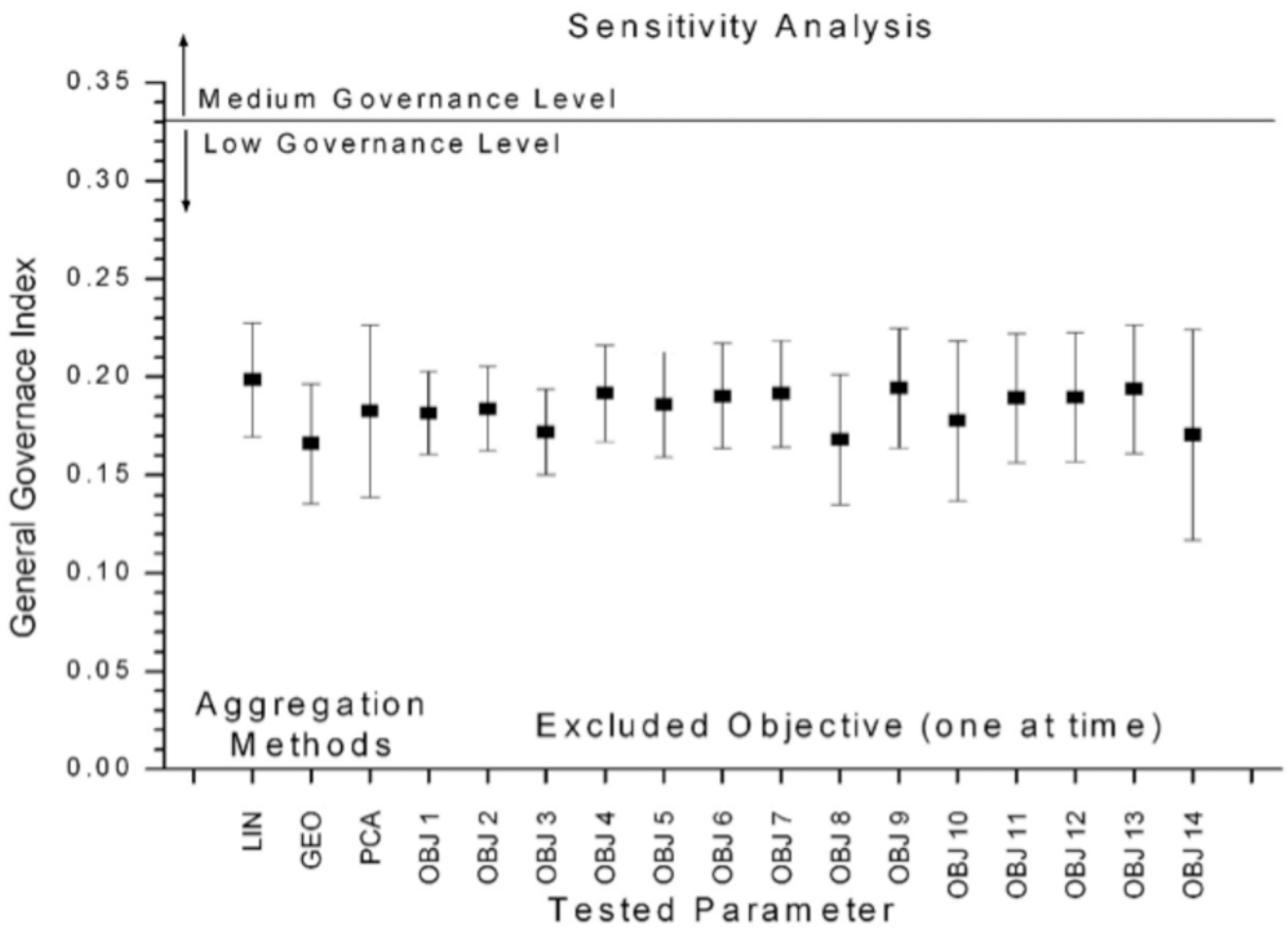


Figure SI.2 - Governance performance by goal (dimension), for each coastal state in the study region. Dimension 1: Ensuring adequate institutional, policy and legal arrangements for the RMPP-CSP.

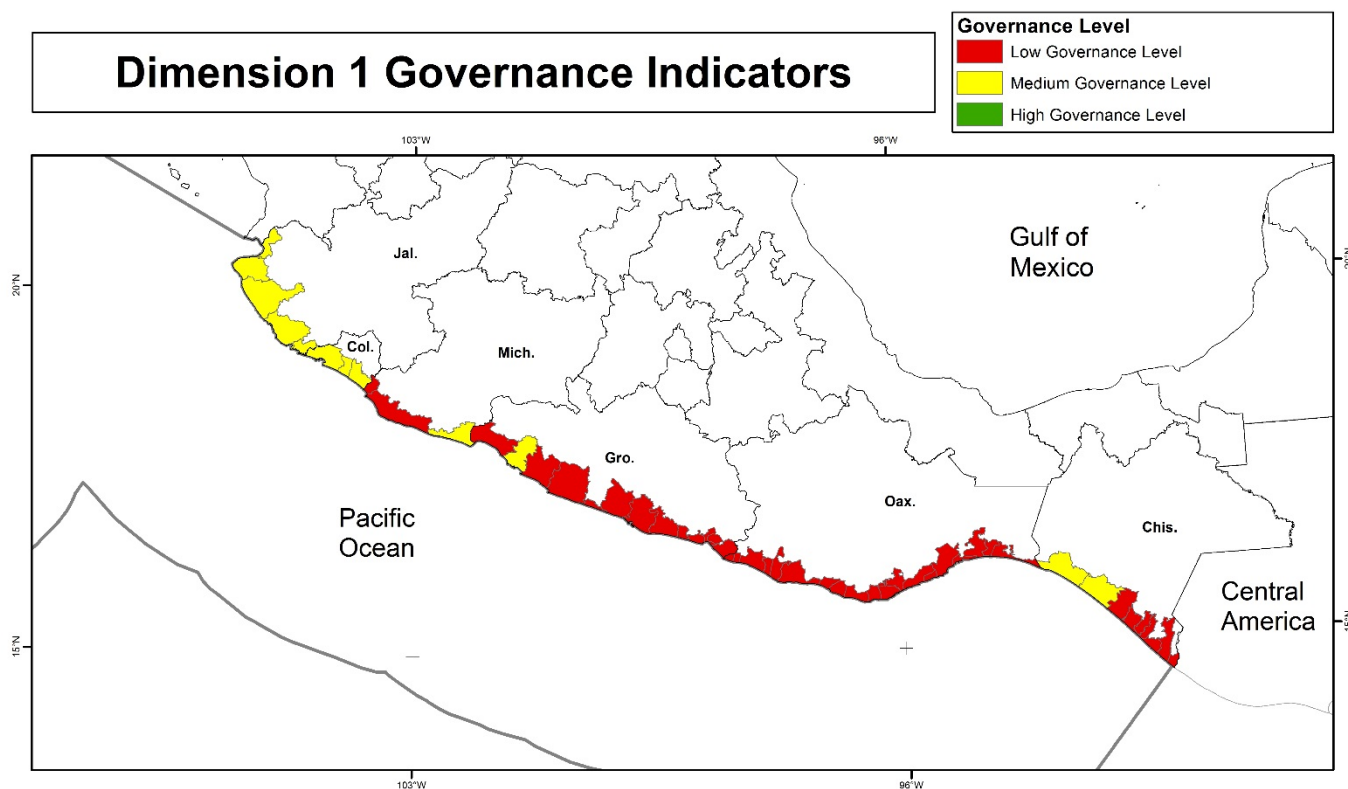


Figure SI.3 - Governance performance by goal (dimension), for each coastal state in the study region. Dimension 3: Enhancing information, knowledge, awareness and participation in the RMPP-CSP.

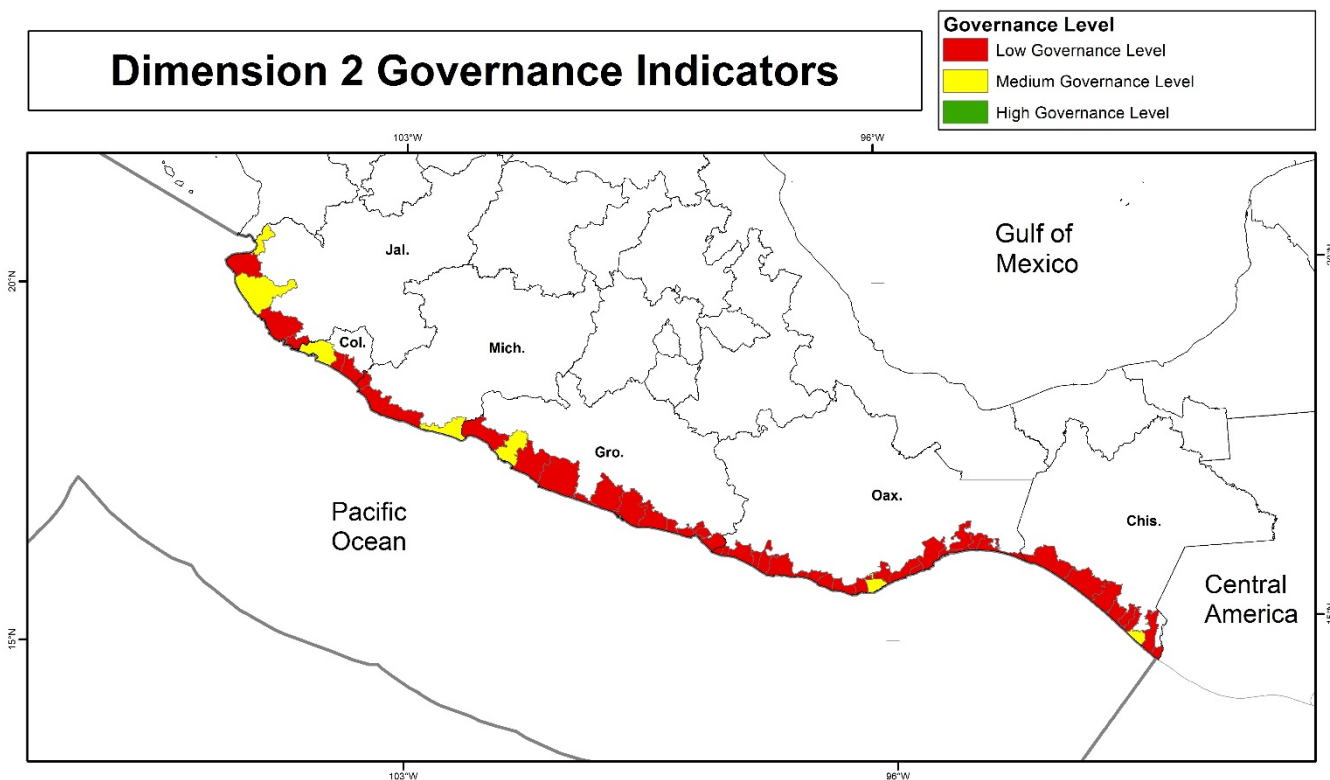


Figure SI.4 - Governance performance by goal (dimension), for each coastal state in the study region. Dimension 2: Ensuring adequate management processes and implementation for the RMPP-CSP.

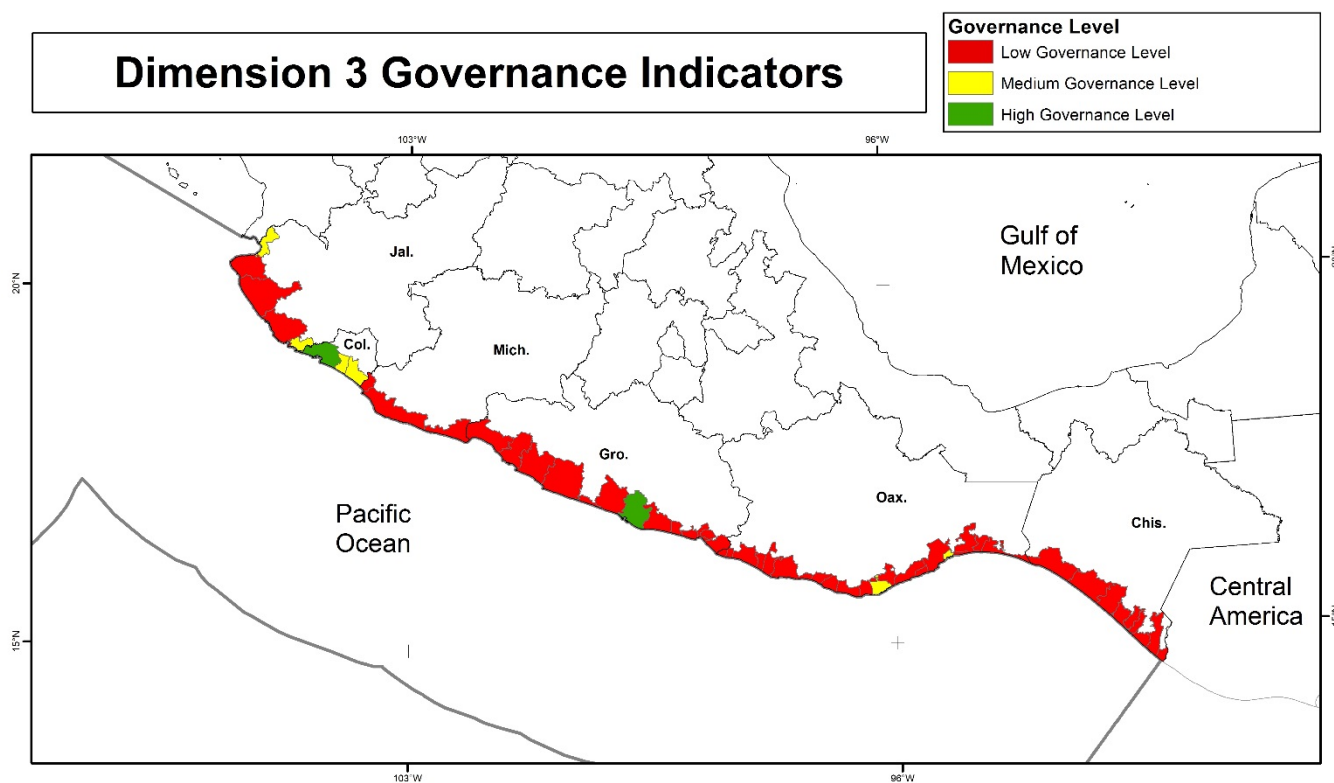


Figure SI.5 - Governance performance by goal (dimension), for each coastal state in the study region. Dimension 4: Mainstreaming the proposals and the economic instruments in the RMPP-CSP.

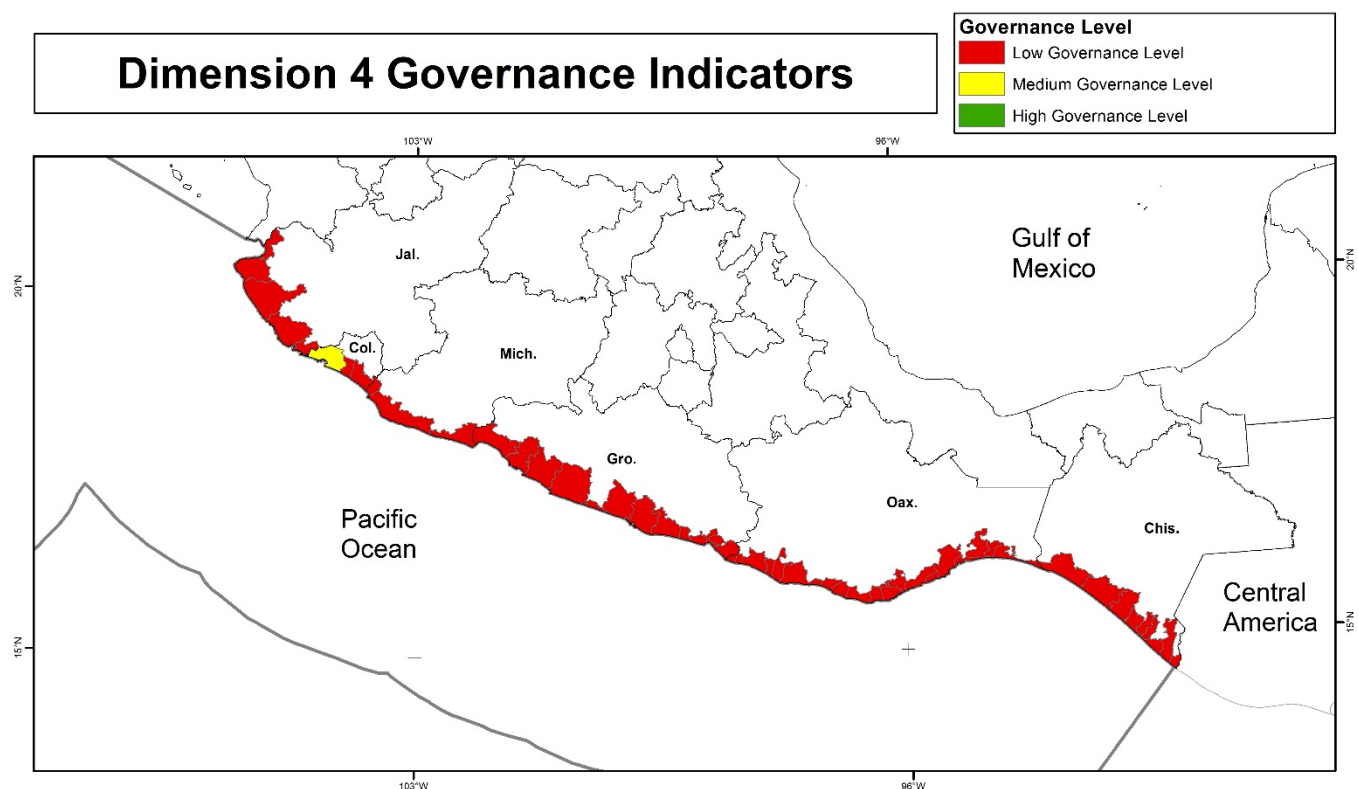


Figure SI.6 - General governance index performance, for each coastal county in the study region.

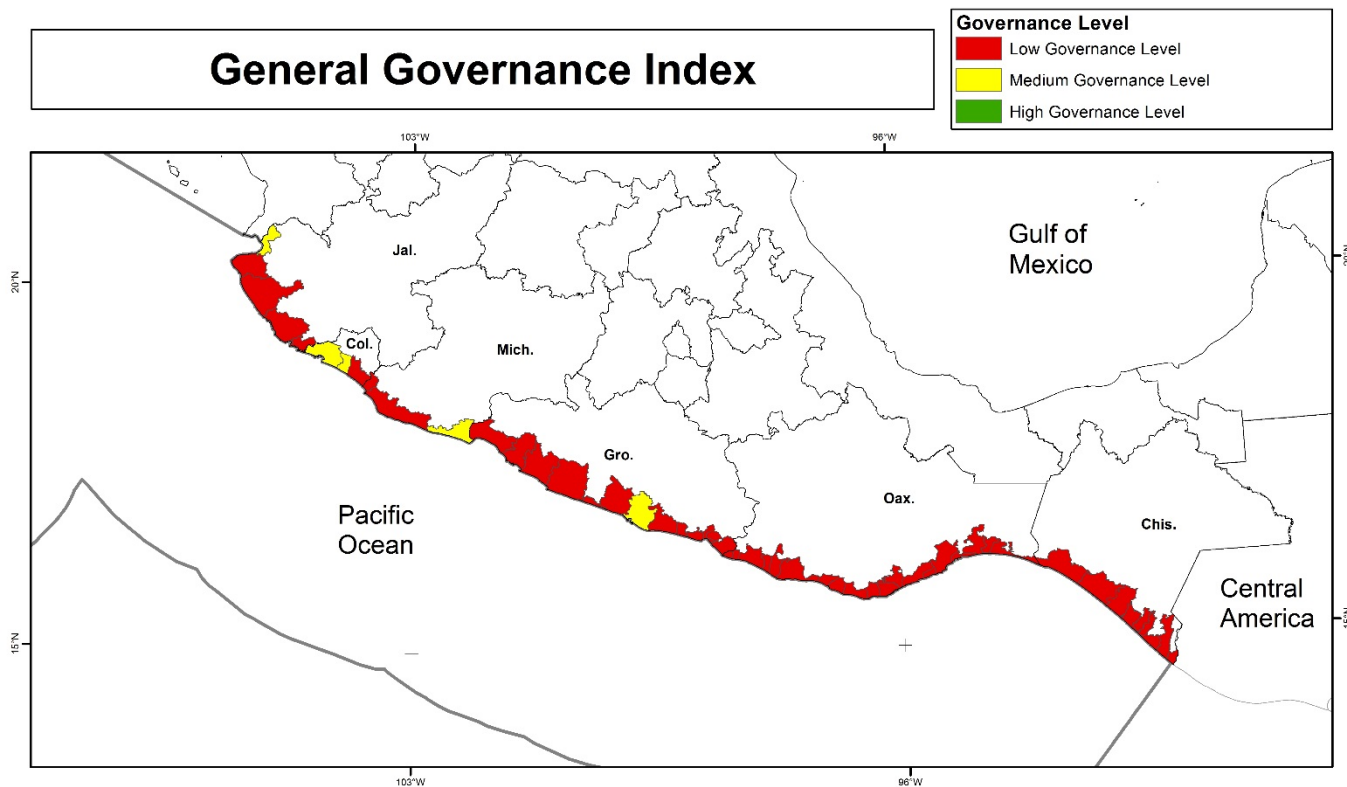


Figure SI.7a - General governance index performance in each coastal municipality. The bars represent the standard error of the measurement.

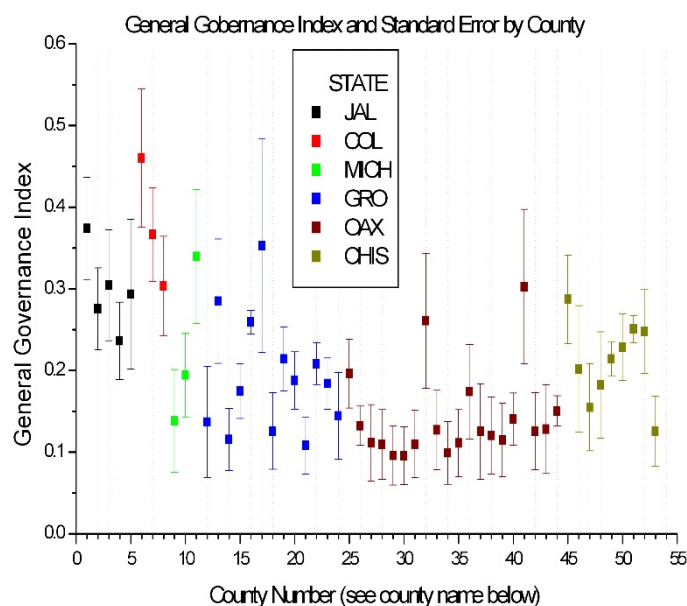


Figure SI.7b - Municipalities names associated with figure SI-6a.

County Name	County Number	County Name	County Number
Puerto Vallarta	1	Juchitán de Zaragoza	25
Cabo Corrientes	2	San Dionisio del Mar	26
Tomatlán	3	San Francisco del Mar	27
La Huerta	4	Santo Domingo Tehuantepec	28
Cihuatlán	5	Santiago Pinotepa Nacional	29
Manzanillo	6	Santiago Jamiltepec	30
Armería	7	Santo Domingo Armenta	31
Tecomán	8	Salina Cruz	32
Coahuayana	9	Santiago Tapextla	33
Aquila	10	San Mateo del Mar	34
Lázaro Cárdenas	11	Santa María Huazolotitlán	35
La Unión de Isidoro Montes de Oca	12	Villa de Tututepec de Melchor Ocampo	36
Zihuatanejo de Azueta	13	San Pedro Huamelula	37
Petalán	14	San Miguel del Puerto	38
Técpán de Galeana	15	Santiago Astata	39
Coyuca de Benítez	16	San Pedro Mixtepec - Distr.22	40
Acapulco de Juárez	17	Santa María Huatulco	41
Benito Juárez	18	Santa María Colotepec	42
San Marcos	19	Santa María Tonameca	43
Florencio Villarreal	20	San Pedro Pochutla	44
Copala	21	Tonalá	45
Cuajinicuilapa	22	Pijijiapan	46
Marquelia	23	Mapastepec	47
Juchitán	24	Acapetahua	48
		Villa Comaltitlán	49
		Huixtla	50
		Tapachula	51
		Mazatán	52
		Suchiate	53

Figure SI.8 - Relationship between quality of life index (1-poverty index), general governance index and environmental quality for the study region.

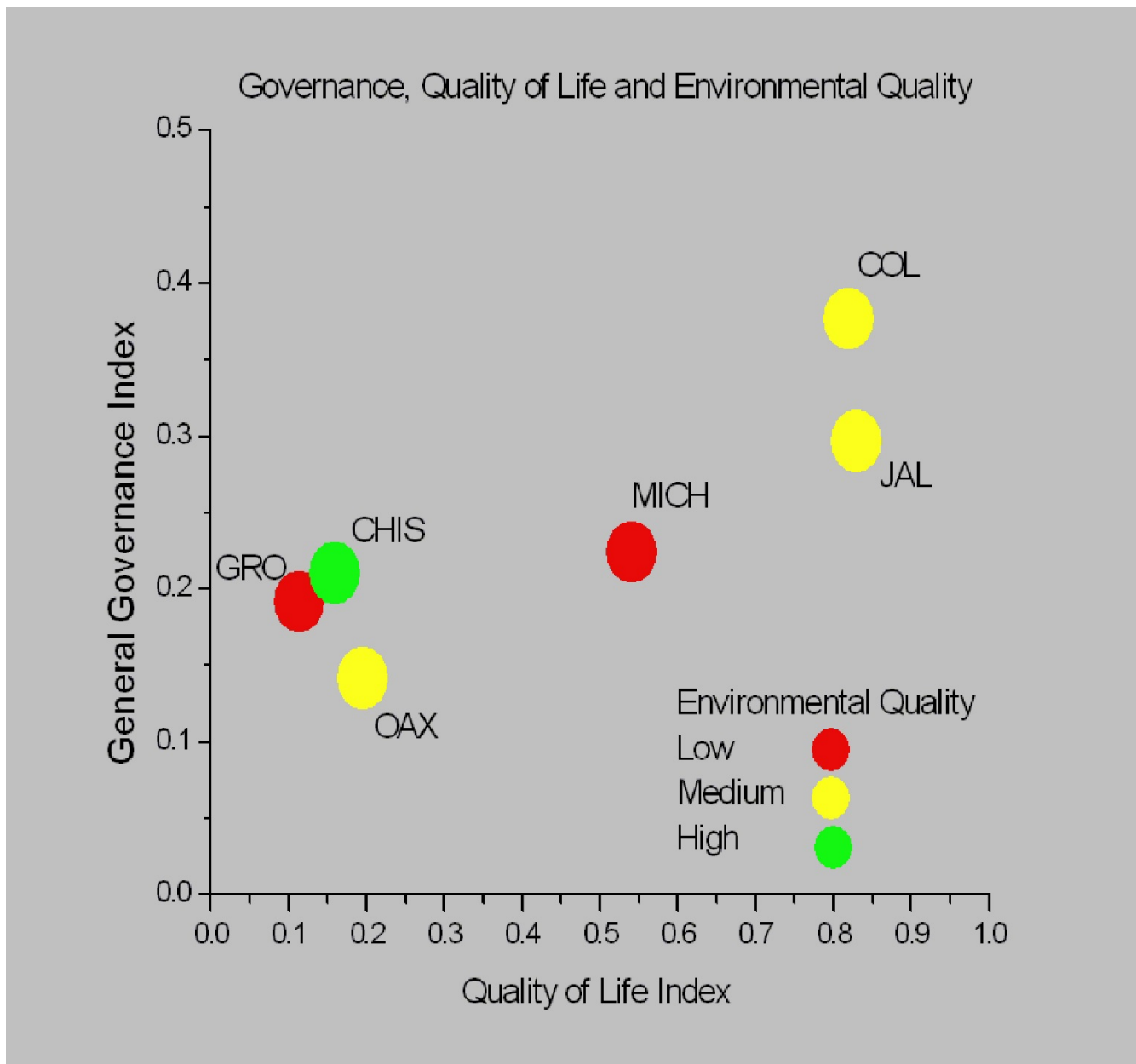


Table SI.I – RMPP-CSP goals, objectives, governance indicators number and the rationale behind its definition or selection.

Goal	Objective	Indicator	Description of the rationale behind the indicator selection	
1.- Ensuring adequate institutional, policy and legal arrangements	1.1	1.1.1	As a coordination mechanism between authorities (Federation, States and Counties), municipalities participation in local (county level) environmental planning processes is an important element to be considered.	
		1.1.2	As a coordination mechanism between authorities (Federation, States and Counties), municipalities participation in regional (two or more counties or states) environmental planning process is an important element to be considered.	
		1.1.3	As a coordination mechanisms inside the administrative county structure, the existence of local commissions such as water and waste management, ecology, territorial planning, forestry, beaches management and others, need to be considered.	
		1.1.4	As a coordination mechanisms among counties, municipalities participation in associations and networks related with marine and coastal issues, for instance “coastal counties association” or “network for counties with port”, need to be included.	
	1.2	1.2.1	As an element to assess the existence of adequate legislation and regulation at county level, this indicator measure the number of laws that are directly or indirectly related to the planning and management of coastal and marine areas.	
		1.3.1	As a part of the environmental assessment procedures, this indicator considers the existence of county regulations for wastewaters, assuming that the lack of it would involve the direct release of sewage into the coastal and marine environment.	
	1.3	1.3.2	As a part of the environmental assessment procedures, this indicator considers the number of projects evaluated by the legal instrument “Environmental Impact Assessment”	
		1.3.3	As a part of the environmental assessment procedures, this indicator contemplates the county surface with mangrove because this is a protected species and not allowed any development over these areas. As a governance indicator, this variable gives us a measure about the restrictions in soil uses in the context of environmental assessment procedures.	
		1.3.4	As a part of the environmental assessment procedures, this indicator evaluates the quality of the coastal environment through two special regulatory programs.	
	1.4	1.4.1	As a participatory conflict-solving space, this indicator evaluates the status of the land-use planning program in the county.	
		1.4.2	As a participatory conflict-solving space, this indicator evaluates the status of the land-use planning program jointly developed by two or more counties or states.	
		1.4.3	As a law enforced mechanism, this indicator measures the number of visits of the Mexico’s Federal Environmental Protection Agency (PROFEPA) to the county.	
		1.4.4	As a law enforced mechanism, this indicator measures the number of inspections directed to specific activities or projects in the county performed by the Mexico’s Federal Environmental Protection Agency (PROFEPA).	
	2.- Ensuring adequate management processes and implementation	2.1	2.1.1	As a part of the instruments needed for the management of coastal and marine issues, this indicator consider the existence of county level development plans.
			2.1.2	As a part of the instruments needed for the management of coastal and marine issues, this indicator evaluates the existence of legally approved county level land-use plans or programs.
			2.1.3	As a part of the instruments needed for the management of coastal and marine issues, this indicator evaluates the existence of legally approved land-use plans or programs for two or more counties or states.
2.1.4			As a part of the instruments needed for the management of coastal and marine issues, this indicator measures the county surface under federal protection, since all protected areas requires by law specific management plans.	
2.2		2.2.1	As a part of the implementing and enforcing actions derived from the planning and management instruments, this indicator measures the volume of wastewaters treated in the county. By law every county has the responsibility to deal with his own domestic wastewaters.	
		2.2.2	As a part of the implementing and enforcing actions derived from the planning and management instruments, this indicator evaluates the existence of legally formed committees related with the “Clean Beaches” program.	

3.- Enhancing information, knowledge, awareness and participation	2.2.3	As a part of the implementing and enforcing actions derived from the planning and management instruments, this indicator evaluates the existence of “Certified Beaches” (similar to “Blue Flag” Program) in the county as an auto regulatory mechanism.
	2.2.4	As a part of the implementing and enforcing actions derived from the planning and management instruments, this indicator evaluates the existence of “Ramsar sites” in the county as an international regulatory instrument.
	2.3.1	As a part of the monitoring instruments for planning and management outcomes, this indicator evaluates the existence of on-line Geographic Information Systems with county level information.
	2.3.2	As a part of the monitoring instruments for planning and management outcomes, this indicator evaluates the existence of “Certified Beaches” in the county as a monitoring element. The “Certified Beaches” program establishes inspection dates and evaluation methodologies that need to be respected by the municipal authority.
	2.3	As a part of the monitoring instruments for planning and management outcomes, this indicator evaluates the existence of “Ramsar sites” in the county as an environmental health monitoring instrument. The Ramsar Convention has several mechanisms to help Contracting Parties designate their most significant wetlands as Ramsar Sites, and to take the steps necessary to maintain their ecosystem components, processes and benefits.
	2.3.3	As a part of the monitoring instruments for planning and management outcomes, this indicator evaluates the existence of “Ramsar sites” in the county as an environmental health monitoring instrument. The Ramsar Convention has several mechanisms to help Contracting Parties designate their most significant wetlands as Ramsar Sites, and to take the steps necessary to maintain their ecosystem components, processes and benefits.
	2.3.4	As a part of the monitoring instruments for planning and management outcomes, this indicator measures the county surface under federal protection, since all protected areas requires specific monitoring and management plans.
	2.4.1	As a part of the economic and administrative structures required supporting the planning process, this indicator evaluates the existence of county “income law”. If the county do not take into account these requirements in the “income law” no governmental funds could be applied in the process.
	2.4	As a part of the economic and administrative structures required supporting the planning process, this indicator measures the county expenditure per capita and per county surface. The logic behind this weighting scheme (per capita and per county surface) is as follow: with the same amount of money, small and low-populated counties could do more for the planning process, than large and densely populated municipalities.
	2.4.2	As a part of the economic and administrative structures required supporting the planning process, this indicator measures the county expenditure per capita and per county surface. The logic behind this weighting scheme (per capita and per county surface) is as follow: with the same amount of money, small and low-populated counties could do more for the planning process, than large and densely populated municipalities.
	3.1.1	As a part of the elements ensuring the use of scientific and technical information for decision-making in the planning process, this indicator measures the number of research centers – marine related- in the county as a potential provider of information and knowledge.
	3.1	3.1.2 As a part of the elements ensuring the use of scientific and technical information for decision-making in the planning process, this indicator measures the number of research centers – fisheries related- in the county as a potential provider of information and knowledge.
	3.1.3	As a part of the elements ensuring the use of scientific and technical information for decision-making in the planning process, this indicator evaluates the existence of risk plans for the county.
	3.2.1	As a part of the elements ensuring sustained support from engaged stakeholders, this indicator measures the number of member of the Council for Sustainable Development in the county. The Council for Sustainable Development is a Federal legally established participatory body of the Environmental Ministry (SEMARNAT).
	3.2	3.2.2 As a part of the elements ensuring sustained support from engaged stakeholders, this indicator measures the number of legally created councils and commissions in the county administration that work in specific areas for the planning process support, such as, ecology, territorial planning, water management, forestry, beaches management, etc.
3.2.3	As a part of the elements enhancing information access, this indicator measures the number of counties with official web page in operation and updated.	
3.2.4	As a part of the elements enhancing information access, this indicator measures the “Potential for public information access”= official web page in operation x % of population with basic studies.	
3.3	3.3.1 As a part of the elements enhancing information access, knowledge, awareness and participation, this indicator measures the number of Nongovernmental organization or Civil society o organizations formally registered in the federal official database. Only coastal and marine related organizations were included.	
3.4	3.4.1 As a part of the elements enhancing information access, knowledge, awareness and participation, this indicator evaluate the existence of legally formed education commission in	

		the county administration.	
	3.4.2	As a part of the elements enhancing information access, knowledge, awareness and participation, this indicator measures the number of research centers –marine sciences related- in the county as a potential capacity building actors.	
	3.4.3	As a part of the elements enhancing information access, knowledge, awareness and participation, this indicator measures the number of research centers –fisheries related- in the county as a potential capacity building actors.	
	3.4.4	As a part of the elements enhancing information access, knowledge, awareness and participation, this indicator evaluates the existence of legally defined Risk Prevention Programs in the county.	
4.- Mainstreaming the proposals and the economic instruments	4.1	4.1.1	As a part of the environmental-friendly technology availability in the region, this indicator measures the number of Eolic power plants in the county.
		4.1.2	As a part of the environmental-friendly technology availability in the region, this indicator measures the number of hydroelectric power plants in the county.
		4.1.3	As a part of the environmental-friendly technology availability in the region, this indicator measures the number of beneficiaries from the energy saving program in aquaculture in the county.
	4.2	4.2.1	As a part of the economic instruments operating in the region, this indicator measures the payments made by the concept of conservation of environmental services in the county.
		4.2.2	As a part of the economic instruments operating in the region, this indicator measures the number of beneficiaries from social and poverty eradication programs in the county.
		4.2.3	As a part of the economic instruments operating in the region, this indicator measures the duties payments obtained from federal zone use in the county.
		4.2.4	As a part of the economic instruments operating in the region, this indicator measures the amount of funds applied in the county through the National Disasters Program (federal program).

Table SI.II – The effect of exclusion one goal at time on the general governance index (sensitivity tests).

Excluded Goal	Minimum Value	Maximum Value	General Governance Index	County with the Highest Score	County with the Lowest Score	Correlation Coefficient with original data
None	0.0884	0.3967	0.1924	Manzanillo, Col.	Santiago Pinotepa Nacional, Oax.	1.0000
Goal 1	0.0546	0.3146	0.1280	Manzanillo, Col.	Santiago Pinotepa Nacional, Oax.	0.9902
Goal 2	0.0493	0.3174	0.1362	Benito Juárez, Gro. (-1)*	Santiago Pinotepa Nacional, Oax.	0.9945
Goal 3	0.0773	0.3178	0.1532	Lázaro Cárdenas, Mich. (-2)*	Juchitán, Gro. (+2)**	0.9904
Goal 4	0.0645	0.3768	0.1597	Benito Juárez, Gro. (-1)*	San Mateo del Mar, Oax. (+2)**	0.9941

From the top ten ranked counties, 8 remains in the top after remove goals 1, 2, 3 and 4.

From the bottom ten ranked counties, 8 remains in the bottom after remove goals 2 and 4.

From the bottom ten ranked counties, 6 remains in the bottom after remove goals 1 and 3.

(*)* Shift in position from the original highest ranked county.

(**) Shift in position from the original lowest ranked county.