

INSTITUTO NACIONAL DE ECOLOGÍA Y CAMBIO CLIMÁTICO
INFORME DE COMISIÓN



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|----------------------------------|
| DRA. MARGARITA CASO CHÁVEZ |
| COORDINADORA GENERAL DE LA CGACC |

Fecha de Informe: 03/05/18

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| FOLIO | 92 |
| DATOS GENERALES | |
| UNIDAD ADMINISTRATIVA | COORDINACIÓN DE ADAPTACIÓN AL CAMBIO CLIMÁTICO |
| EVENTO | Reunión anual del Comité Trilateral para la Conservación y Manejo de la Vida Silvestre y los Ecosistemas |
| LUGAR | Shepherdstown, West Virginia, USA |
| FECHA DE REALIZACIÓN | 08 al 13 de abril de 2018 |
| INFORME | |
| OBJETIVO DEL PROMARNAT QUE CUMPLE | México próspero. Objetivo 4.4. Estrategia 4.4.1. y 4.4.4. Objetivo 6. |
| TEMA PRIORITARIO DEL PROGRAMA INSTITUCIONAL | -Fortalecimiento de capacidades y cooperación científica y técnica -Monitoreo ambiental |
| OBJETIVO DE LA COMISIÓN | |
| -Participar en la Mesa de "Conservación de Ecosistemas" de la Reunión Trilateral. -Presentar los temas preparados por la CGACC ante la Mesa. | |
| ACTIVIDADES REALIZADAS POR EL COMISIONADO | |
| <ul style="list-style-type: none"> • Participación en el taller de intercambio de experiencias. • Presentación de 2 temas ante la Mesa de Ecosistemas: <ul style="list-style-type: none"> - National Atlas of Vulnerability to Climate Change. Outgoing results. - Digital Platform for Inter-institutional Coordination for the attention of wetlands in Mexico. | |
| RESULTADOS OBTENIDOS Y LOGROS PARA EL INEC C | |
| <ul style="list-style-type: none"> • Se estrechó la relación con el Comité Trilateral de América del Norte. • Actualmente tenemos una mayor certeza sobre las posibles sinergias y colaboraciones Comité Trilateral - INECC. • Se acordó que para la reunión de 2020 la temática de la plenaria será "Océanos e islas". | |
| CONCLUSIONES | |
| La participación en esta reunión fue sumamente enriquecedora en términos académicos y de gestión de política pública a nivel internacional. Me ha provisto de elementos de información, fuentes y contactos que permitirán una mejor aportación a otros proyectos y grupos de trabajo en los que participo, particularmente el Atlas Nacional de Vulnerabilidad ante el Cambio Climático. | |
| REQUIERE SEGUIMIENTO: | si |
| SE INCLUYEN ANEXOS: | Si |

ERWIN ARMANDO MARTÍ FLORES

JEFE DE DEPARTAMENTO DE ANÁLISIS ESPACIAL DE LAS ESPECIES Y SU HÁBITAT PARA LA ADAPTACIÓN AL CAMBIO CLIMÁTICO.

Declaro bajo protesta de decir verdad, que los datos contenidos en este informe son verídicos y manifiesto tener conocimiento de las sanciones que se aplicarán en caso contrario.



NATIONAL VULNERABILITY TO CLIMATE CHANGE ATLAS

Ongoing Results

Adaptation to Climate Change

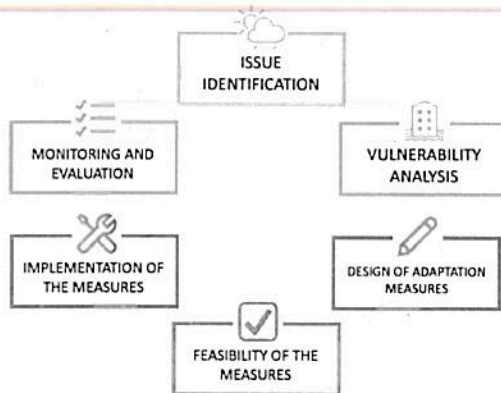
"Measures and adjustments in human or natural systems, in response to climatic inputs, projected or real, or its effects, which may moderate the damage, or take advantage of its beneficial aspects" LGCC.

- Adaptation to climate change is necessary for sustainable development.
- Vulnerability to climate change is unequal in the different in a community's groups.

It should be considered for:

- natural resources management,
- approach new productive practices,
- water and food security,
- human health,
- disaster risk management based on the best available information
- approaching gender equity and human rights.

Adaptation process



VULNERABILITY

It's the inability of the system to cope with the adverse effects of climate change, climate variability and extreme events.

CGACC, based on IPCC, 2007



In climate terms, is the character, magnitude, and rate of change that affects a system



It is affectation degree of a system by climatic variability due to the characteristics that define it



It refers to the human and institutional resources that allow to trigger the process of adaptation to a specific climatic problem

PECC 2014-2018 Special Program on Climate Change

What is the NVCCA?

It is a tool that represents the territorial vulnerability, current and future, related to climate to contribute to decision making in the matter of adaptation to climate change in the context of development planning

First Workshop

- 37 agencies of the federal government and UNDP-Mexico participated.
- Sectoral issues associated with climate were identified.
- Working groups were set up: Population, Economic Activities, Infrastructure and Natural Capital.

Second Workshop

- 34 agencies of the federal government and UNDP-Mexico participated.
- The issues associated with climate were prioritized
- Institutional resources were identified to address the issues.
- Work agenda agreed upon

In both workshops, the inter-institutional collaboration to consolidate the ANVCC was strengthened



Vulnerabilities

POPULATION



Población Desplaves

Densidad Población

Población Inundaciones

ECONOMIC ACTIVITIES



Producción Ganadera Inundaciones

Cambio en Aptitud Potencial

Producción Forrajera Inundaciones

INFRASTRUCTURE



Infraestructura Desplaves

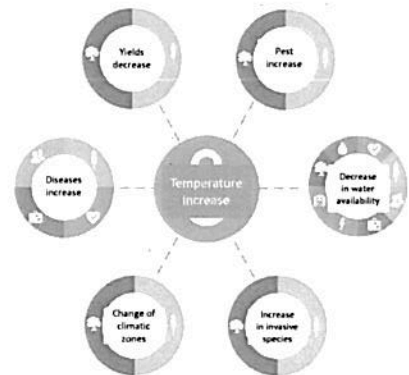
Producción Ganadera Aridez

NATURAL CAPITAL



Issues

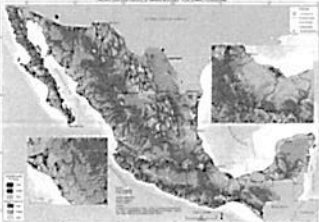
- Primary sector
- Energy
- Population
- Health
- Water
- Infrastructure
- Tourism
- Natural capital



Background

Población Inundaciones

Population potentially affected by floods: 24 millions (Saavedra, 2010)



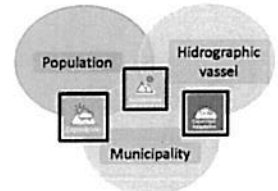
2007 **Tabasco**
Loss and damage cost up to USD\$3100 million and impacted 123,000 houses (CEPAL, 2008)

Nacional **2012**
Affected million people and it was recognized as the most frequent extreme weather event (Cavazos, 2015)

2015 **Nacional**
Heavy rain and floods represents 62% of total loss and damages reported by CENAPRED.

Population vulnerability to floods in municipalities of Mexico

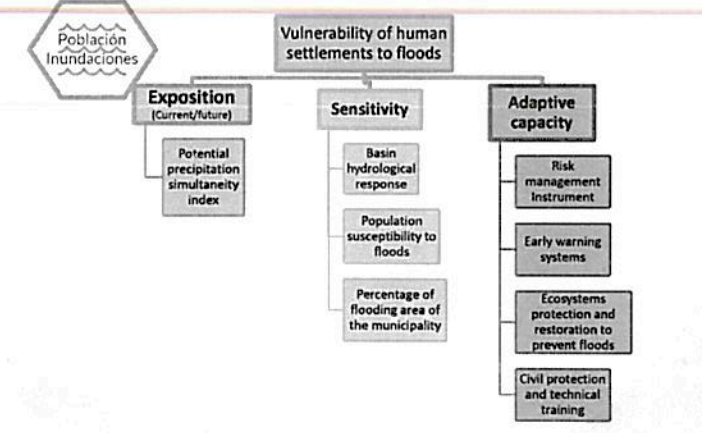
Issue:
Flood impacts on population



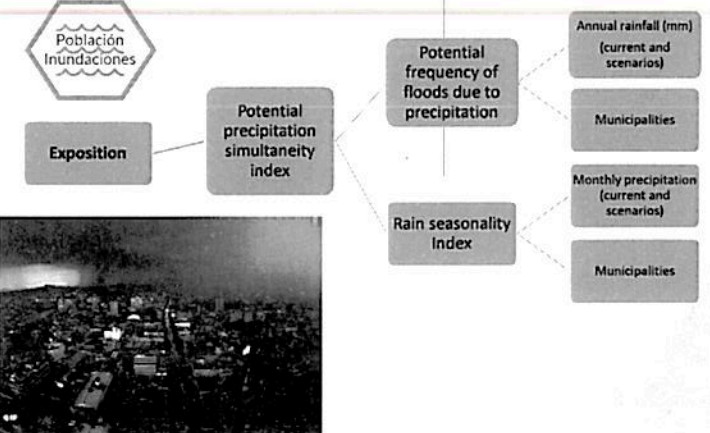
- Variable integration**
- Using multicriteria analysis
 - Variables features
 - Measurable
 - National representation
 - Oficial sources
 - updatable

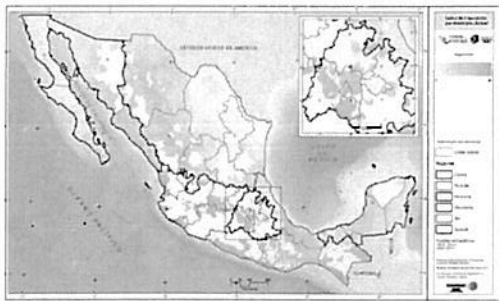
Operative variables were proposed using relevant, validated and updated information

Evaluation Structure

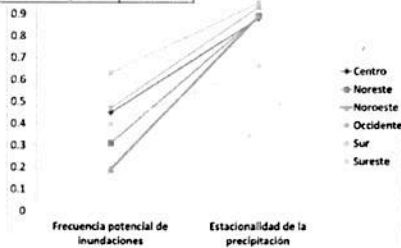


Exposition

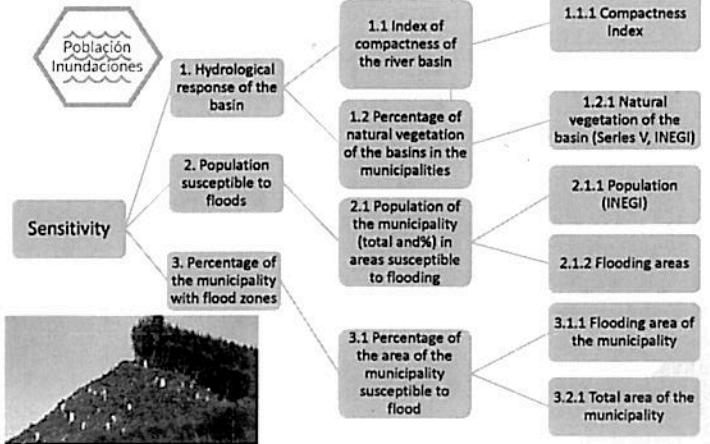




EXPOSICIÓN

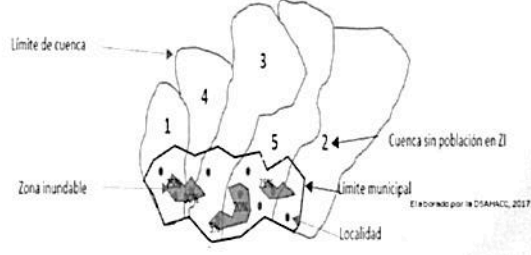
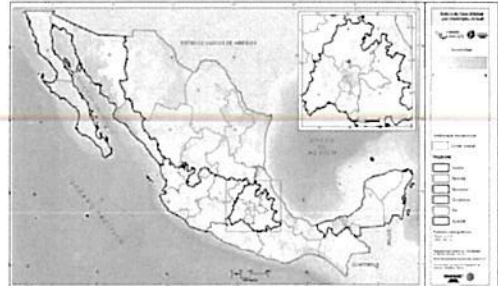


Sensibilidad



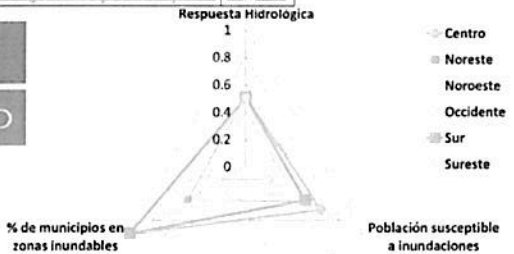
Functional criteria applied to Political-Administrative units

The basins with round to oval shape concentrate surface flows more quickly, generating violent sudden peaks and rapid recessions in the face of extraordinary precipitation events. This favors direct runoff and increases the risk of flooding (Ortiz-Vera, 2015)

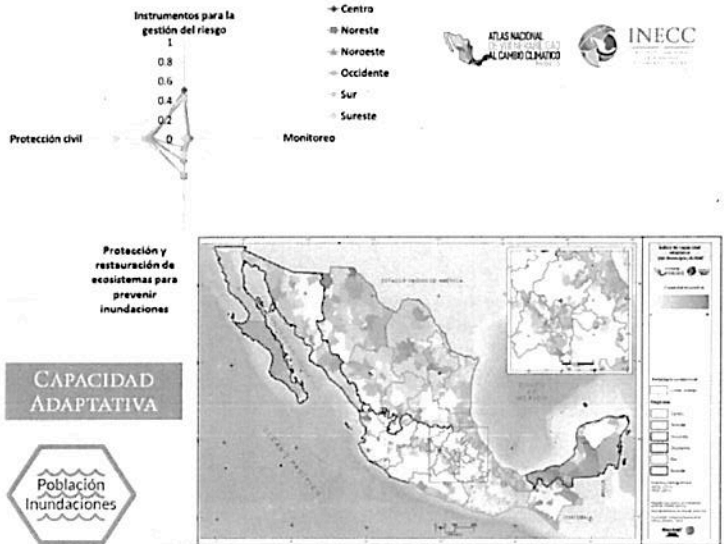
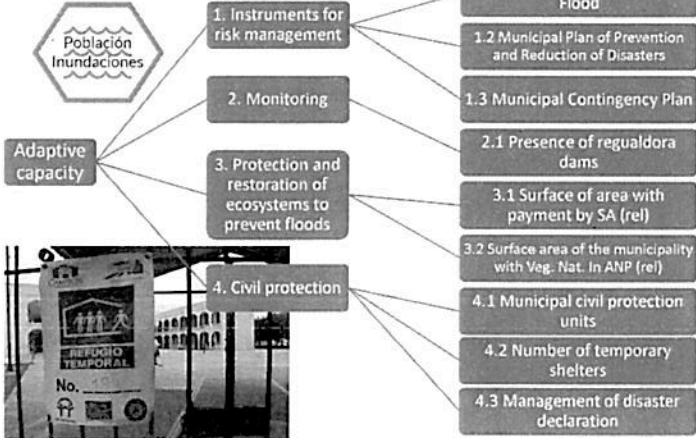


Sensitivity

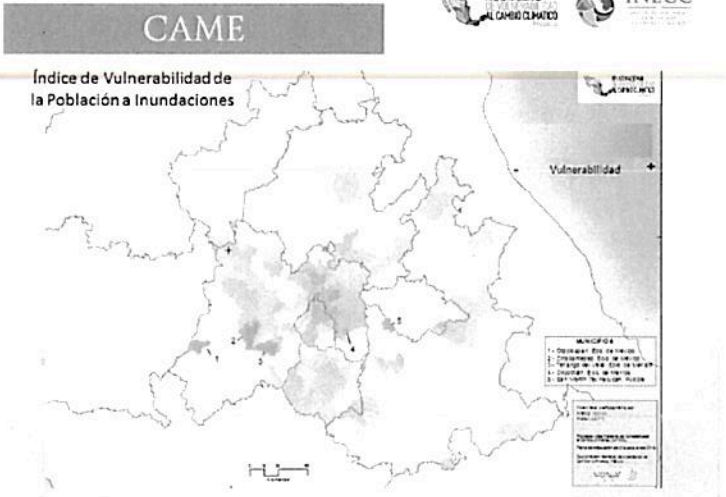
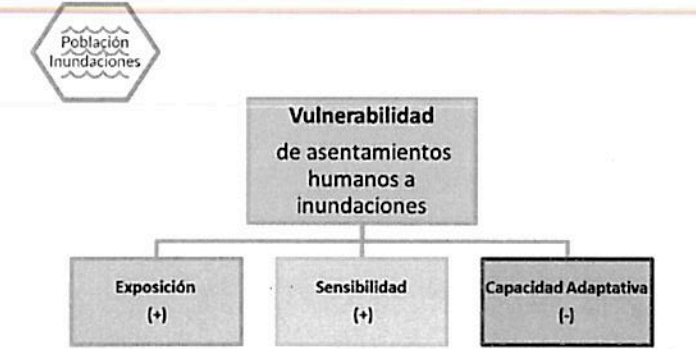
SENSIBILIDAD



Adaptive capacity



VULNERABILIDAD



Recomendaciones



| | |
|------------------------------------|---|
| Hydrological response of the basin | Increase the natural vegetation in the basins (municipalities) |
| Population susceptible to floods | Reduce the population in areas susceptible to flood (municipality) |
| % municipality with flood zones | Implement urban development plans, risk atlases and contingency plans |



| | |
|--|---|
| Instruments for risk management | Atlas of Municipal Flood Risk, Municipal Plan for Prevention and Disaster Reduction, Municipal Contingency Plan |
| Monitoring | Increase the network of regulatory dams |
| Ecosystem protection and restoration to prevent floods | Increase the area with payment for environmental services. Increase areas of natural protection (ANP) |
| Civil protection and technical training | Enforce civil protection. Increase the number of temporary shelters. |

Thank you

References

Cavazos, T. (Ed.). (2015). *Conviviendo con la Naturaleza: El Problema de los Desastres Asociados a Fenómenos Hidrometeorológicos y Climáticos en México*. Ediciones ILCSA S.A. de C. V. C. Retrieved from http://usuario.cicase.mx/~tcavazos/pdf/T_Cavazos_Libro_REDSClim_2015.pdf

CEPAL. (2008). *TABASCO: CARACTERÍSTICAS E IMPACTO SOCIOECONÓMICO DE LAS INUNDACIONES PROVOCADAS A FINALES DE OCTUBRE Y A COMIENZOS DE NOVIEMBRE DE 2007 POR EL FRENTE FRÍO NÚMERO 4*. Retrieved from https://www.cepal.org/publicaciones/vml/3/33373/1864_parte_1_de_8.pdf

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Ortiz-Vera, O. (2015). Similitud hidráulica de sistemas hidrológicos altoandinos y transferencia de información Hidrometeorológica. *Tecnología y Ciencias del Agua*. Vol. VI, núm. 4. Pp.35-44.

PECC. (2014). *Programa Especial de Cambio Climático (PECC)*. Retrieved from [http://www.sagarpa.gob.mx/desarrollorural/Programa Especial de Cambio Climático 2014-2018 \(PECC\)/Documents/Programa Especial de Cambio Climático 2014-2018_Versión de Difusión.pdf](http://www.sagarpa.gob.mx/desarrollorural/Programa%20Especial%20de%20Cambio%20Climatico%202014-2018%20(PECC)/Documents/Programa%20Especial%20de%20Cambio%20Climatico%202014-2018_Versión%20de%20Difusión.pdf)

Saavedra, F. (2015). Vulnerabilidad de la población frente a inundaciones e inestabilidad de laderas. H. Cotler [Coordinadora]. *Las cuencas hidrográficas de México. Diagnóstico y Priorización*. Instituto Nacional de Ecología, SEMARNAT-Fundación Gonzalo Río Arriba I.A.P.



Digital Platform for Inter-institutional Coordination for the attention of wetlands in Mexico

XXIII Annual Meeting Of The
Canada – Mexico – United States
Trilateral Committee For Wildlife And Ecosystem
Conservation and Management
April 9-12, 2018



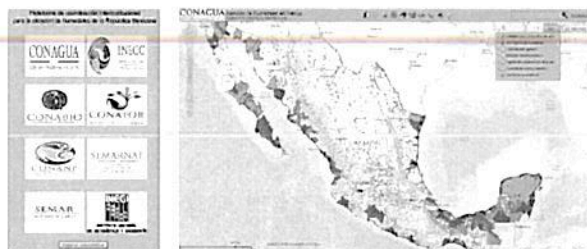
Digital Platform for Inter-institutional Coordination for the attention of wetlands in Mexico

It responds to the need in Federal Government to combine actions to consolidate the conservation, restoration and sustainable management of wetlands in Mexico.



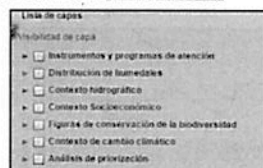
- i) Coordinated inter-institutional wetland management
- ii) Align programs and resources for wetlands attention
- iii) Address wetlands in coastal plains including the mangroves
- iv) A territorial and ecosystemic approach to the attention of wetlands
- v) Development of a digital platform for diagnosing and baseline of the efforts deployed by different institutions around wetlands
- vi) Identify possible areas of intervention where the efforts of various institutions could converge

Digital Platform for Inter-institutional Coordination for the attention of wetlands in Mexico



http://sigagis.conagua.gob.mx/atencion_humedales/

Designed to access, visualize and analyze information from federal government agencies on the issue of coastal wetlands.



Prioritization of coastal wetland zones based on attention needs

The prioritization considers three main criteria:

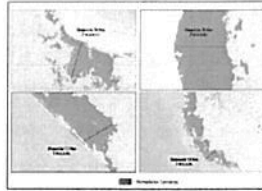
- i. ecological relevance of coastal wetlands and anthropogenic pressure
- ii. exposure to current extreme events and vulnerability to climate change
- iii. current environmental policy instruments in coastal wetlands



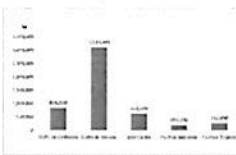
The territorial vision was incorporated by using hydrological basins with coastal wetlands as a unit of prioritization

Delimitation of coastal wetlands

- Wetlands were delimited based on the National Wetland Inventory (CONAGUA, 2012) and the -MDE 30m (INEGI, 2016).
- Measurements of wetland coverage were made. The average altitude of the limit inland was identified.
- It was considered as coastal wetlands those whose polygonal representation coincides totally or partially with the elevation of 5 meters above the mean sea level.



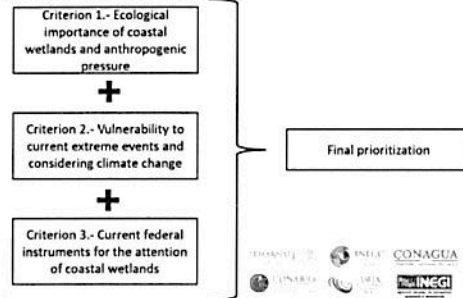
Total area of coastal wetlands: 5 million ha
Of the 756 hydrological basins, 304 contain coastal wetlands.



A modification of the regionalization proposed by CONABIO (2003) was used, considering the Marine and Coastal Ecoregions of the CCA.

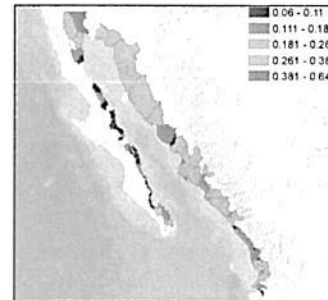
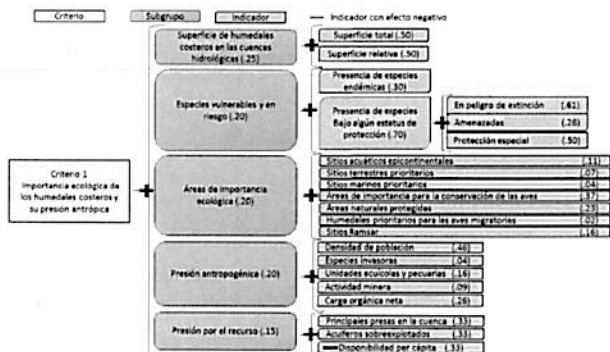
Model for the prioritization of hydrological basins for the attention of coastal wetlands.

- Objective: to identify the geographical coincidences of desirable attributes in watersheds containing coastal wetlands
- The variables were arranged in a structure of groups and sub-groups following the logic of hierarchical analysis (Saaty, 1980) and were added following the premises of multicriteria analysis (Malczewski, 1999).



Criterion 1.- Ecological importance of coastal wetlands and anthropogenic pressure

Objective: to identify the hydrological basins that has the higher coverage of coastal wetlands, for their high biodiversity and for the use to which they are subject.



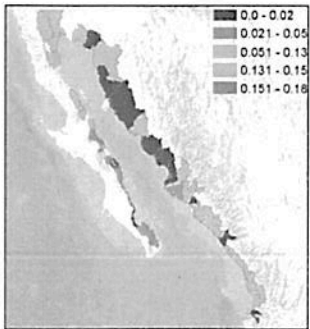
Final values Criterion 1. Ecological importance of coastal wetlands and anthropogenic pressure. Values close to one represent the basins with the highest scores according to the indicators considered

* La estructura, composición y ponderación de las variables se retomaron del estudio "Adecuación de Algoritmos e Indicadores para la Priorización de Cuencas Hidrológicas Prioritarias para la Atención de Humedales - Fase II" de CONAGUA (2012).

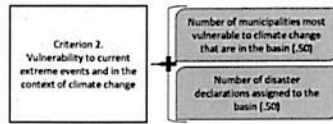


Criterion 2. Vulnerability to current extreme events and in the context of climate change

Objective: to prioritize the attention in the coastal wetlands in the basins with greater exposure to tropical cyclones and with the population most vulnerable to climate change.



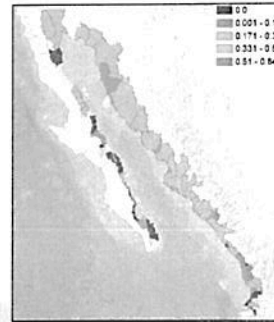
Final values criterion 2. Vulnerability to current extreme events and in the context of climate change



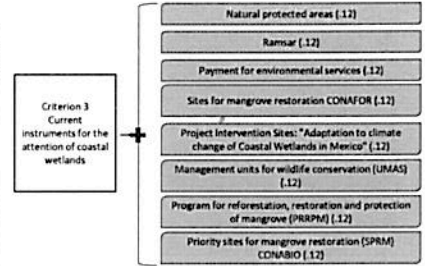
Information sources:
 • PECC
 • Municipalities with declarations of disaster (CENAPRED)

Criterion 3. Current instruments for the attention of coastal wetlands.

Objective: to identify the basins that present intervention instruments in the coastal wetlands they contain, in order to facilitate the coordination of efforts to conserve, restore and take advantage of these systems.

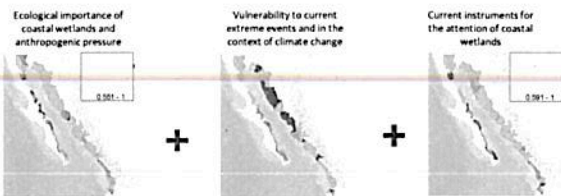


Valores finales criterio 3. Instrumentos vigentes para la atención de humedales costeros

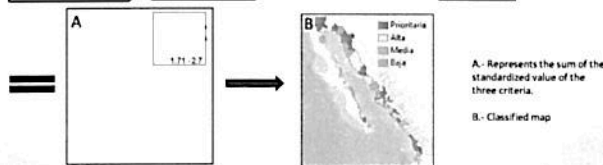


Information sources:
 • ANP and Ramsar sites (CONANP)
 • Properties approved under the PSA scheme in mangroves (CONAFOR)
 • Sites with approved projects for the restoration of mangroves (CONAFOR)
 • Premises under the UMAS scheme in coastal wetlands (DGVS-SEMARNAT)
 • Sites in the PRRPM (SEMAR)
 • SPARM (CONABIO)

Integration of variables: Standardization of values by region. Linear sum without weighting



The maps represent the standardized values for the Gulf of California region for each of the criteria.



Priority hydrological basins for the attention of coastal wetlands: Of the 304 basins, 46 present the priority category according to the criteria considered

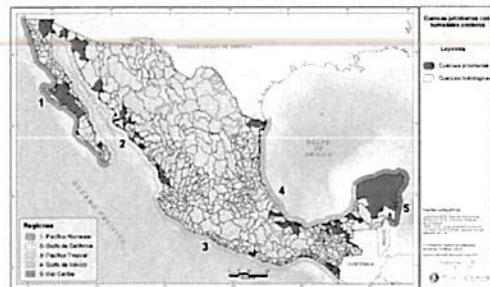


Figura 6. Cuencas hidrográficas prioritarias para la atención de humedales costeros.

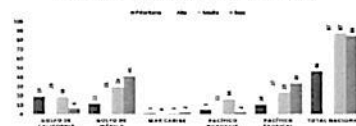
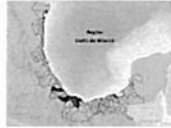


Figura 7. Número de cuencas por categoría de priorización en cada región.

Región Golfo de México y Mar Caribe

| Identificador de cuenca (CONAGUA, 2016) | Superficie total de la cuenca (km²) | Superficie total de humedales en la cuenca (km²) | Superficie relativa de humedales en la cuenca (%) |
|---|-------------------------------------|--|---|
| 162 | 5,450.09 | 27.96 | 0.45 |
| 176 | 6,432.26 | 1,217.98 | 18.94 |
| 189 | 4,542.41 | 439.29 | 9.67 |

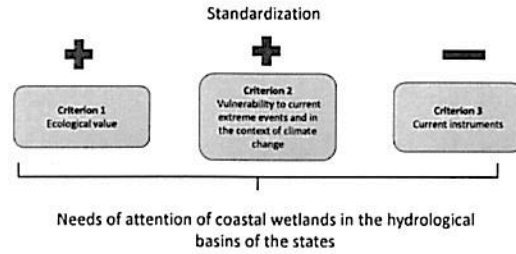


| Región a la que pertenece la cuenca | Identificador de cuenca | Densidad de población (hab/km²) | Nº. de municipios más vulnerables, empalmados en la cuenca | Nº. de declaraciones de desastres en la cuenca | Nº. de declaraciones de desastres por municipio | Estado | Disponibilidad Por siglo (Mm³/100 años) | Instrumentos en la cuenca que aplican a los humedales |
|-------------------------------------|-------------------------|---------------------------------|--|--|---|----------|---|--|
| Golfo de México | 162 | 327 | 0 | 17 | La Antigua (9) Nocua del Río (3) VERACRUZ (4) | Veracruz | 1,809.95 | 3 instrumentos: SÍGOS RANSMAR y Áreas Naturales Protegidas, LBDS, Aprovechamiento Sustentable del Manglar |
| | 176 | 13.41 | 0 | 69 | Acuña (1) Alvarado (1) Alvaro B. Cabalcá (4) Carmineo (8) Comandante en Jefe (2) Ignacio de la Llave (1) Ixtacalcoatlán (1) Lerdo de Tejada (1) Mecatlan (1) SERRANITO (4) San Andrés Tuxtla (1) SANTO DOMINGO DE BUENOS (1) Terra Blanca (2) Tehuacan (1) Tehuacan (4) Tehuacan (1) | Veracruz | 41,008.93 | 4 instrumentos: SÍGOS RANSMAR, Áreas Naturales Protegidas, Pagos por Servicios Ambientales, Unidades de Manejo para el Aprovechamiento Sustentable del Manglar |
| | 189 | 87.86 | 2 Cuernavaca (CUALBA) OR Orajoso y San Andrés Tuxtla | 31 | Atlixcoatlán (1) Carmineo (1) Baltazar de Obeso (1) San Pedro de Cueva (4) San Andrés Tuxtla (1) San Juan Evangelista (1) Tehuacan (1) | Veracruz | 7,711.09 | Un instrumento: SÍGOS RANSMAR |

Identification of coastal wetland attention needs in Mexico

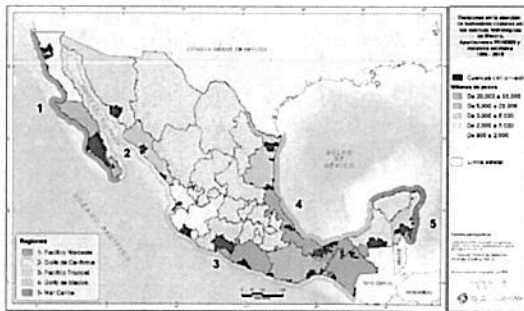
The absence in the implementation of federal government programs and instruments in coastal wetlands is considered.

The greatest value is given to watersheds with coastal wetlands that do not have or have few federal instruments of attention in each of the states.



Identification of coastal wetland attention needs in Mexico

We identified 52 watersheds distributed in 17 states with little or no attention of federal instruments in their coastal wetlands and that at the same time they have a high ecological value, high exposure to tropical cyclones, and contain the most vulnerable municipalities to climate change.



In these cases, special attention programs will be designed with the help of other agencies, organizations and local actors

Watersheds with attention needs, FONDEN contributions and state disbursements (millions of pesos).

