



Riqueza y composición de helechos y licófitos en tres áreas de bosque mesófilo en Los Tuxtlas, Veracruz, México

Amparo R. Acebey, Juan Carlos López-Acosta, J. Daniel Tejero-Díez, Thorsten Krömera

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Resumen

El bosque mesófilo de montaña (BMM) en México es el ecosistema con mayor riqueza de flora por área, donde destacan los helechos y licófitos por su riqueza y abundancia. Sin embargo, existen pocos estudios comparativos de cómo cambian la riqueza y composición de especies en las diferentes áreas de BMM, siguiendo una metodología estándar. Con este fin, se muestrearon 10-13 parcelas de 20 × 20 m cada una, en 3 áreas de BMM en los 2 volcanes principales de la región de Los Tuxtlas, Veracruz. Se comparó la riqueza de especies y se analizó la similitud florística mediante Anosim y, escalamiento multidimensional (NMDS); además, se identificaron las especies que contribuyen más a la disimilitud. Se registraron 71 especies de helechos y 3 de licófitos, en 37 géneros y 15 familias. Las diferencias en la riqueza en las 3 áreas no fueron significativas, mientras que la composición de especies sí mostró diferencias significativas. Estas diferencias se explican por especies exclusivas o con frecuencias contrastantes entre áreas, cuyas características parecen estar fuertemente relacionadas con el microclima y los suelos, así como con la intensidad de perturbación antropogénica.

<https://www.sciencedirect.com/science/article/pii/S1870345317301288>

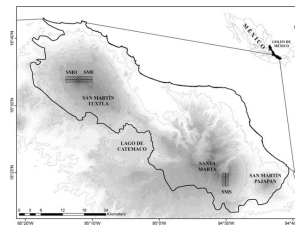
Canopy height variation and environmental heterogeneity in the tropical dry forests of coastal Oaxaca, Mexico

Silvia H. Salas-Morales, Edgar J. Gonzalez, Jorge A. Meave

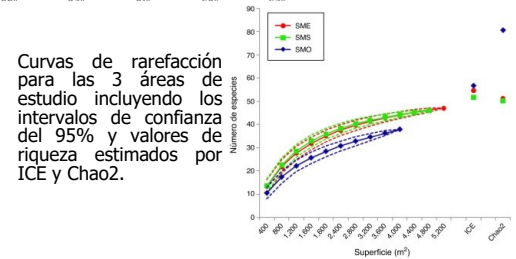
Abstract

Despite its importance for carbon storage and other ecosystem functions, the variation in vegetation canopy height is not yet well understood. We examined the relationship between this community attribute and environmental heterogeneity in a tropical dry forest of southern Mexico. We sampled vegetation in 15 sites along a 100-km coastal stretch of Oaxaca State, and measured the heights of all woody plants (excluding lianas). The majority of the ca. 4000 individuals recorded concentrated in the 4–8 m height range. We defined three plant sets to describe overall community canopy height at each site: a set including all plants, a set made up by the tallest plants representing 10 percent of all individuals, and a set comprising the 10 tallest plants. For each site we computed maximum height and the mean and median heights of the three sets. Significant collinearity was observed between the seven resulting height variables, but null distributions constructed through bootstrap revealed their different behaviors as functions of species richness and density of individuals. Through linear modeling and a model selection procedure, we identified 21 models that best

La alta variación en la composición florística por área constituye información relevante para planear estrategias de conservación al algoritmo de extracción de lineamientos.

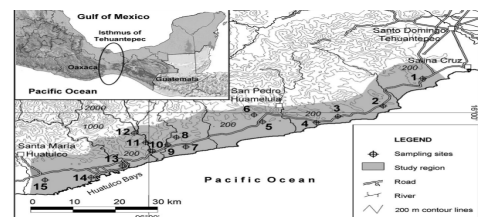


Mapa de la región de Los Tuxtlas, Veracruz, México, mostrando el área de estudio.



Curvas de rarefacción para las 3 áreas de estudio incluyendo los intervalos de confianza del 95% y valores de riqueza estimados por ICE y Chao2.

described the variation in canopy height variables. These models pointed out to soil (measured as PC1 of a principal component analysis performed on 10 soil variables), water stress, and elevation as the main drivers of canopy height variation in the region. In the event of increasing water stress resulting from global climate change, the studied tropical dry forests could become shorter and thus decrease their carbon storage potential.



Location of the 15 tropical dry forest study sites in coastal Oaxaca, Mexico (upper panel), and geographical distribution of the most important environmental variables according to the linear regression models

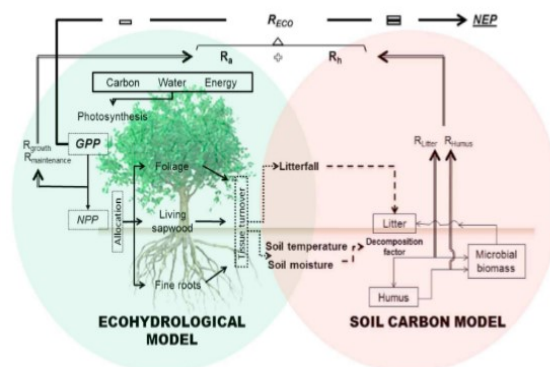
<https://onlinelibrary.wiley.com/doi/pdf/10.1111/btp.12491>

Climate Change Impacts on Net Ecosystem Productivity in a Subtropical Shrubland of Northwestern México

Vela-Pelaez A.A., Torrescano-Valle N., Islebe G.A., Mas J.F., Weissenberger H.

Abstract

The sensitivity of semiarid ecosystems to climate change is not well understood due to competing effects of soil and plant-mediated carbon fluxes. Limited observations of net ecosystem productivity (NEP) under rising air temperature and CO₂ and altered precipitation regimes also hinder climate change assessments. A promising avenue for addressing this challenge is through the application of numerical models. In this work, we combine a mechanistic ecohydrological model and a soil carbon model to simulate soil and plant processes in a subtropical shrubland of northwest México. Due to the influence of the North American monsoon, the site exhibits net carbon losses early in the summer and net carbon gains during the photosynthetically active season. After building confidence in the simulations through comparisons with eddy covariance flux data, we conduct a series of climate change experiments for near-future (2030–2045) scenarios that test the impact of meteorological changes and CO₂ fertilization relative to historical conditions (1990–2005). Results indicate that reductions in NEP arising from warmer conditions are effectively offset by gains in NEP due to the impact of higher CO₂ on water use efficiency. For cases with higher summer rainfall and CO₂ fertilization, climate change impacts lead to an increase of ~25% in NEP relative to historical conditions (mean of 66 g C m⁻²). Net primary production and soil respiration derived from decomposition are shown to be important processes that interact to control NEP and, given the role of semiarid ecosystems in the global carbon budget, deserve attention in future simulation efforts of ecosystem fluxes.



Conceptual diagram of model-based estimation of ecosystem carbon fluxes using *trIBS-VEGGIE* and soil carbon model. Dotted lines depict ecohydrological model outputs into the soil carbon model, while double lines specify sources of autotrophic, heterotrophic, and ecosystem respiration (RECO = Ra + Rh). Net ecosystem productivity (NEP) is obtained as GPP - RECO.

<https://aquapubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2017JG004361>

A Simple and Universal Aerosol Retrieval Algorithm for Landsat Series Images Over Complex Surfaces

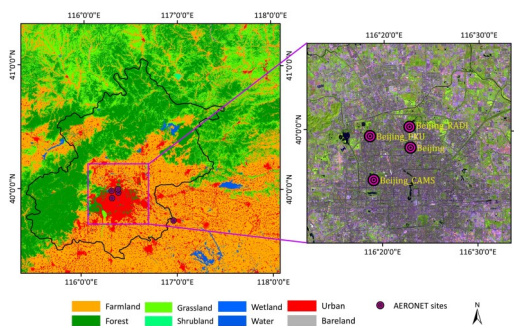
Cjing Wei, Bo Huang, Lin Sun, Zhaoyang Zhang, Lunche Wang, Muhammad Bilal

Abstract

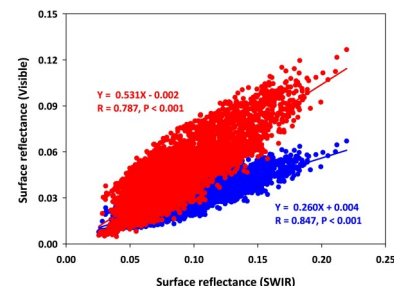
Operational aerosol optical depth (AOD) products are available at coarse spatial resolutions from several to tens of kilometers. These resolutions limit the application of these products for monitoring atmospheric pollutants at the city level. Therefore, a simple, universal, and high-resolution (30 m) Landsat aerosol retrieval algorithm over complex urban surfaces is developed. The surface reflectance is estimated from a combination of top of atmosphere reflectance at short-wave infrared (2.22 μm) and Landsat 4–7 surface reflectance climate data records over densely vegetated areas and bright areas. The aerosol type is determined using the historical aerosol optical properties derived from the local urban Aerosol Robotic Network (AERONET) site (Beijing). AERONET ground-based sun photometer AOD measurements from five sites located in urban and rural areas are obtained to validate the AOD retrievals. Terra MODerate resolution Imaging Spectrometer Collection (C) 6 AOD products (MOD04) including the dark

target (DT), the deep blue (DB), and the combined DT and DB (DT&DB) retrievals at 10 km spatial resolution are obtained for comparison purposes. Validation results show that the Landsat AOD retrievals at a 30 m resolution are well correlated with the AERONET AOD measurements ($R^2 = 0.932$) and that approximately 77.46% of the retrievals fall within the expected error with a low mean absolute error of 0.090 and a root-mean-square error of 0.126. Comparison results show that Landsat AOD retrievals are overall better and less biased than MOD04 AOD products, indicating that the new algorithm is robust and performs well in AOD retrieval over complex surfaces. The new algorithm can provide continuous and detailed spatial distributions of AOD during both low and high aerosol loadings.

Relationships of atmospherically corrected surface reflectance in the blue (0.48 μm) and red (0.66 μm) channel with surface reflectance in the SWIR



Location of AERONET ground-based sites in the Beijing and surrounding areas. Land use cover is provided by global land cover mapping at 30 m spatial resolution.



<https://aquapubs.onlinelibrary.wiley.com/doi/>

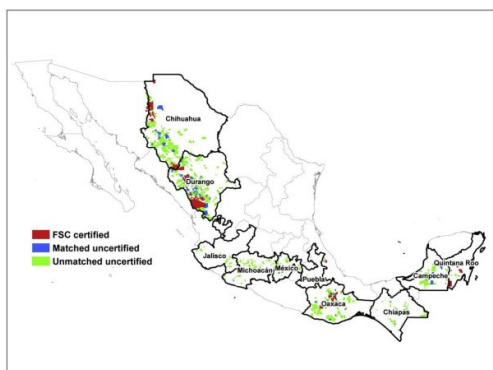
Does eco-certification stem tropical deforestation? Forest Stewardship Council certification in Mexico

Allen Blackman, Leonard Goff, Marisol Rivera Planter

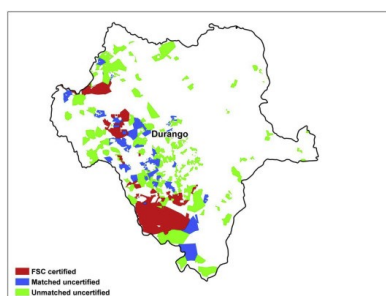
Abstract

Since its creation more than 25 years ago as a voluntary, market-based approach to improving forest management, forest certification has proliferated rapidly in developing countries. Yet we know little about whether and under what conditions it affects deforestation. We use rich forest management unit-level panel data—including information on deforestation, certification, regulatory permitting, and geophysical and socioeconomic land characteristics—along with matched difference-in-differences

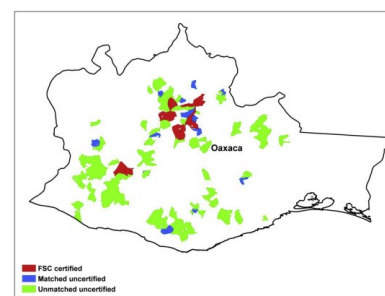
models to identify the effect of Forest Stewardship Council (FSC) certification on deforestation in Mexico, the country with the third-highest number of FSC certifications in the developing world. We test for a variety of different temporal and subgroup effects but are unable to reject the null hypothesis that certification does not affect deforestation.



Forest management units (FMUs) constituting the regression sample: criteria for selection of these 859 FMUs include: (i) located in 13 federal entities with significant forest cover and (with one exception) some history of FSC certification; (ii) feature communal (ejido and comunidad) land tenure; and (iii) had forestry permits with reliable geolocator data during at least part of 2001–2012 study period.



Forest management units constituting regression sample in Durango state.



Forest management units constituting regression sample in Oaxaca state.

<https://www.sciencedirect.com/science/article/pii/>

Detección de árboles dañados por plaga en bosques de *Abies religiosa* en la Reserva de la Biosfera Mariposa Monarca, mediante fotografías aéreas infrarroja

Leautaud Valenzuela Pablo, López García José

Abstract

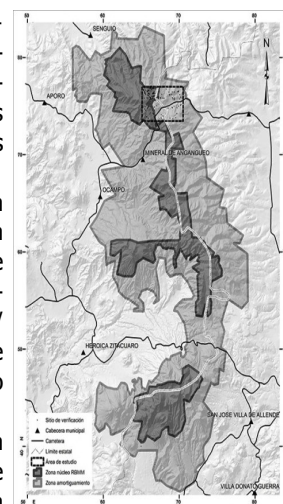
Las plagas forestales son agentes que ocasionan daños de tipo mecánico o fisiológico a los árboles, como deformaciones, disminuciones en el crecimiento, debilitamiento o incluso la muerte, causando un impacto ecológico, económico y social importante. En este estudio se desarrolla una técnica para la detección de plaga forestal por medio de fotografías aéreas infrarrojas.

El uso de fotografías aéreas digitales en color e

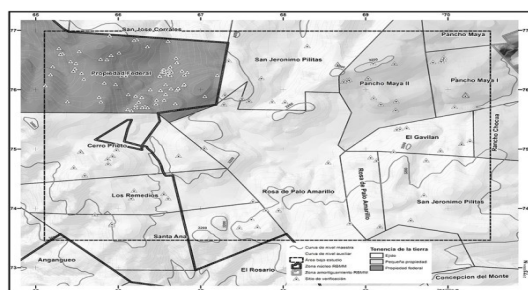
infrarrojo permitió obtener imágenes VIR (visible + infrarrojo) con cuatro bandas y una resolución aproximada de un metro por píxel. Mediante la interpretación visual se logró reconocer y localizar árboles con algún estado de deterioro e incluso individuos muertos.

Se analizó una superficie de 1 907 ha en sierra Chincua, donde la mayor afectación se dio en zona núcleo con 97 puntos (62%) con más del doble de densidad de individuos (11 árboles/km²) en comparación con la zona de amortiguamiento (4 árboles/km²). Este mayor daño es debido a las políticas de manejo forestal, que establecen el no manejo (incluido el saneamiento) en la zona núcleo.

Las fotografías aéreas digitales son útiles para la detección de árboles dañados en los bosques de oyamel mediante la interpretación visual con una eficiencia del 98%. El método utilizado tiene una mayor relación costo-efectividad comparado con sobrevuelo de helicóptero y trabajo de campo.



Área en estudio dentro de la Reserva de la Biosfera Mariposa Monarca, México.



Localización de los puntos de verificación (árboles dañados) dentro del área en estudio. Se muestra la mayor densidad punto dentro de la zona núcleo (11 árboles/km²) en comparación con la zona de amortigua-

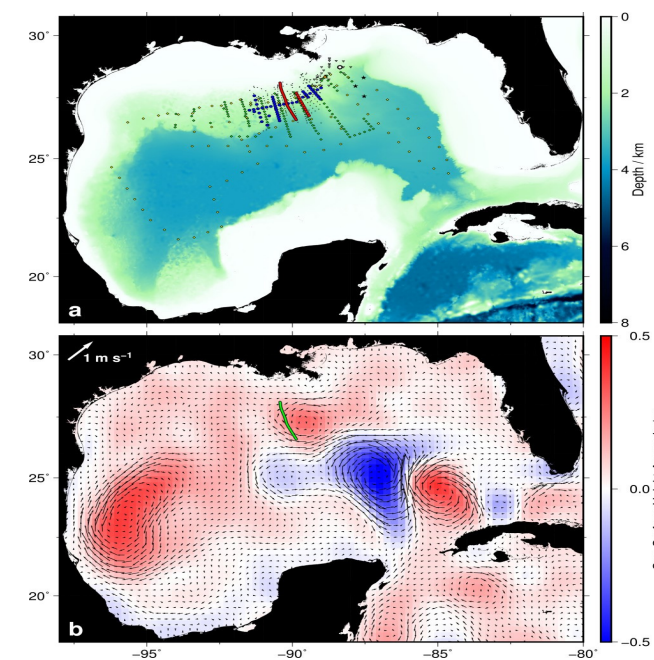
<https://www.sciencedirect.com/science/article/pii/>

Spatial Variation of Diapycnal Diffusivity Estimated From Seismic Imaging of Internal Wave Field, Gulf of Mexico

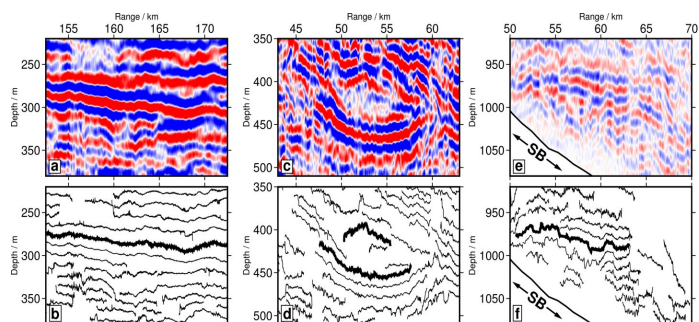
Alex Dickinson, N. J. White, C. P. Caulfield

Abstract

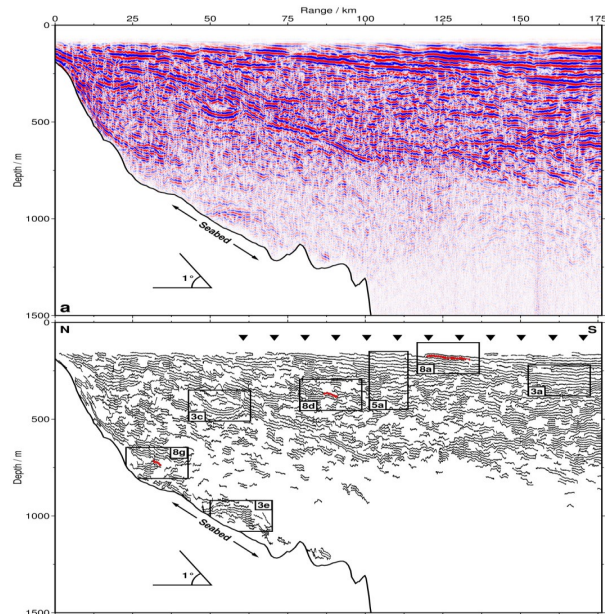
Bright reflections are observed within the upper 1,000 m of the water column along a seismic reflection profile that traverses the northern margin of the Gulf of Mexico. Independent hydrographic calibration demonstrates that these reflections are primarily caused by temperature changes associated with different water masses that are entrained into the Gulf along the Loop Current. The internal wave field is analyzed by automatically tracking 1,171 reflections, each of which is greater than 2 km in length. Power spectra of the horizontal gradient of isopycnal displacement, are calculated from these tracked reflections. At low horizontal wave numbers ($k_x < 10^{-2}$ cpm), in agreement with hydrographic observations of the internal wave field. The turbulent spectral subrange is rarely observed. Diapycnal diffusivity, K , is estimated from the observed internal wave spectral subrange of each tracked reflection using a fine-scale parametrization of turbulent mixing. Calculated values of K vary between 10^{-8} and 10^{-4} $m^2 s^{-1}$ with a mean value of $m^2 s^{-1}$. The spatial distribution of turbulent mixing shows that $m^2 s^{-1}$ away from the shelf edge in the upper 300 m where stratification is strong. Mixing is enhanced by up to 4 orders of magnitude adjacent to the shoaling bathymetry of the continental slope. This overall pattern matches that determined by analyzing nearby suites of CTD casts. However, the range of values recovered by spectral analysis of the seismic image is greater as a consequence of significantly better horizontal resolution.



(a) Bathymetric map of Gulf of Mexico. Red line = seismic profile acquired between 24 and 25 July 2002; black dots = 249 regional CTD casts acquired in June–August of 1990–2010; blue circles = 63 CTD casts acquired by R/V Pisces between 22 August and 1 September 2010 (certain CTDs are repeated); red circles = subset of 12 CTD casts from transect acquired between 30 and 31 August 2010; black stars = loci of 3 ADCPs from 2005 experiment of Jing et al. (2015); gray inverted triangles = 22 microstructural profiles acquired during 2013 experiment of Wang et al. (2016); orange triangle = approximate location of tracer injection from 2013 experiment of Ledwell et al. (2016); green diamonds = loci of 4 month tracer measurements of Ledwell et al. (2016); yellow diamonds = loci of 12 month tracer measurements of Ledwell et al. (2016); white circle = location of accidental spillage at Deepwater Horizon platform. (b) Synoptic map showing 7 day average of sea-surface height anomalies straddling 24 July 2002. Black arrows = barotropic geostrophic velocity field (scale at top left-hand corner); green line = seismic profile crossing prominent anticyclonic eddy.



(a) Plot labeled 3a in Figure 2b. (b) Tracked reflections. Thick track = representative reflection showing internal waves with small amplitudes. (c) Plot labeled 3c in Figure 2b. (d) Tracked reflections. Pair of thick tracks = top and bottom of eddy showing differences in amplitudes of internal waves. (e) Plot labeled 3e in Figure 2b. SB = sea bed. (f) Tracked reflections. Thick track = representative reflection showing internal waves with large amplitudes.



(a) Processed and stacked seismic profile plotted as function of range and depth. Red/blue events = reflective boundaries with positive/negative acoustic impedance; open triangle = 1° angle for reference. (b) 1,171 tracked reflections that are greater than 2 km in length (see text for details). Boxes labeled 3a, 3c, and 3e = loci of zooms shown in Figure 3; box labeled 5a = locus of zoom shown in Figure 5; boxes labeled 8a, 8d, and 8g with highlighted red reflections = loci of observed events that are spectrally analyzed in Figure 8; inverted black triangles = projected locations of 12 CTD casts acquired by R/V Pisces between 30 and 31 August 2010 (see Figure 1a).

<https://agupubs.onlinelibrary.wiley.com/doi/10.1002/2017JC013352>

NOTICIAS

Un investigador descubre un patrón del cambio climático aplicando una nueva metodología

El investigador del grupo de investigación Dinámica y Óptica no Lineal y Láseres (DONLL) de la UPC en el Campus de Terrassa (Catalunya, España), Dario Zappalá, ha publicado recientemente un estudio en la revista científica de referencia 'Earth System Dynamics' en el que se ponen de manifiesto grandes anomalías en las oscilaciones de las temperaturas en zonas cercanas al Polo Norte y en la Amazonia. Zappalá ha cuantificado y caracterizado estos cambios, y ha encontrado un patrón utilizando una metodología poco común en el estudio del cambio climático, que aplica a las oscilaciones y a los cambios de amplitud y frecuencia de las temperaturas.

Dario Zappalá ha utilizado una metodología que no es habitual en el estudio de las temperaturas y que se basa en el análisis de los resultados después de aplicar 'la transformada de Hilbert', una ecuación que también se ha utilizado, por ejemplo, para detectar terremotos o para estudiar el comportamiento de señales eléctricas y biomédicas. "Nuestro trabajo proporciona una herramienta más para caracterizar el cambio climático, es decir, otra perspectiva desde la que analizarlo. Cuantas más perspectivas diferentes tengamos, podremos entender qué está pasando y, por tanto, mejor podremos actuar", argumenta Zappalá.



<http://noticiasdelaciencia.com/not/28895/un-investigador-descubre-un-patron-del-cambio-climatico-aplicando-una-nueva-metodologia/>

Científicos muestran la resistencia de la Gran Barrera de Coral australiana a drásticos cambios ambientales naturales

La Gran Barrera de Coral de Australia ha superado durante los últimos 30.000 años los cambios en el nivel medio del mar y las variaciones climáticas asociadas a los mismos hasta en cinco episodios. Así se desprende de una investigación internacional en la que participa el catedrático del departamento de Estratigrafía y Paleontología de la UGR (España) Juan Carlos Braga Alarcón, y que ha sido publicada por la revista Nature Geoscience.

<http://noticiasdelaciencia.com/not/28787/cientificos-muestran-la-resistencia-de-la-gran-barrera-de-coral-australiana-a->



Este trabajo internacional en el marco del "International Ocean Discovery Program" (IODO) ha permitido reconstruir la evolución del arrecife más importante del planeta en los últimos 30 milenios, para analizar su respuesta a los bruscos cambios ambientales.

La investigación ha demostrado que el arrecife es más resistente de lo previsto a cambios ambientales relevantes, como el aumento del nivel del mar y la temperatura del agua, aunque, por otra parte, ha mostrado una notable sensibilidad a la entrada de sedimentos o el agua de mala calidad.

Logran la restauración hidrológica de humedales impactados por actividades productivas



Los humedales constituyen ecosistemas muy valiosos, desde un punto de vista hidrológico, ecológico y económico. Además de los servicios ambientales que cumplen, como la regulación del ciclo del agua y la fijación del carbono atmosférico, son componentes paisajísticos, constituyen reservas de aguas para distintos usos y tienen valor productivo.

En este marco, la Universidad Nacional de Tierra del Fuego (UNTDF) (Argentina), conjuntamente con la Fundación Humedales, lideró un Proyecto de Restauración Hidrológica de una Turbera ubicada sobre una extensión natural de 15 hectáreas de un área protegida del centro de la Isla, que fuera abandonada en los últimos veinte años sin que se hubieran cerrado los drenajes, dando lugar así a un ambiente altamente degradado en plena reserva natural.

Los trabajos implicaron el desarrollo de experiencias de instalación de obras de cierre de los drenajes de la turbera piloto usando materiales de bajo costo, como placas de fibrocemento, madera o simplemente con relleno de turba, dependiendo de las características de las zanjas de drenaje. La eficiencia de estos bloqueos del drenaje permitió dar lugar al inicio del restablecimiento de los niveles de agua en el humedal.

<http://noticiasdelaciencia.com/not/28869/logran-la-restauracion-hidrologica-de-humedales-impactados-por-actividades-productivas/>

2o Congreso Internacional de Áreas Naturales Protegidas

<http://www.conacytprensa.mx/index.php/sociedad/eventos/evento/2505-2o-congreso-internacional-de-areas-naturales-protegidas>



El XV Congreso Internacional sobre Sostenibilidad Medioambiental, Cultural, Económica y Social

The banner features a green geometric pattern on the left side. Text on the left includes the congress title, dates, location, and a subtitle. On the right, it lists the organizing institutions: the International Institute for the Inclusive Museum and the University of British Columbia. A small logo is visible in the bottom left corner of the banner.

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