

# 'Land2Coast' Workshop Reports

30-31 March 2017



Image: Participatory mapping of land use impacts at Tulum workshop (Edward Hind-Ozan)

## Introduction

The *Land2Coast* research consortium organised two workshops on 30 and 31 March 2017 to discover and document stakeholder knowledge and opinion on land use, coastal zone management, and water governance in Quintana Roo, Mexico. This report documents the workshop context, workshop activities, and workshop results.

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## **Quintana Roo consultation**

The Land2Coast project organised two workshops on Thursday 30 March 2017, at Casa de Cultura, Tulum, QR, and on Friday 31 March 2017 at the Palacio Municipal, Bacalar, QR. Each workshop was independent, but had broadly the same programme. The reason for organising workshops in two different location was to facilitate the attendance of those resident in both northern and southern Quintana Roo. Both workshops were facilitated by researchers from Cardiff University and Manchester University in the United Kingdom, Universidad Nacional Autónoma de México (UNAM), and El Colegio de Frontera Sur (ECOSUR). Organisation of the workshops was led by Healthy Reefs for Healthy People. The workshops were attended by over 30 participants, including representatives from local and regional government, research institutions, the water, forestry, and tourism sectors, and from environmental non-government organisations (eNGOs). A full list of represented institutions can be found in table 1. A number of (unlisted) consultants and professionals also attended in an individual capacity.

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**Table 1 - Institutions and organizations represented at Land2Coast workshops**

Ahua Properties	National Commission of Natural Protected Areas (CONANP)
Healthy Reefs for Healthy People	The College of the South Border (ECOSUR)
Association of Aquatic Services Providers of the Riviera Maya A.C. (APSA)	Karisma Hotels and Resorts
Association of Hotels of the Riviera Maya (AHRM)	Municipality of Cozumel
The Water Sentinels	Municipality of Othón P. Blanco
The Ecological Centre of Akumal (CEA)	Municipality of Puerto Morelos
Colectividad Razonatura A.C.	Municipality of Solidaridad
National Water Commission (CONAGUA)	Municipality of Tulum
Basin Committee of the Bacalar Lagoon System	Secretariat of Ecology and Environment (SEMA)
Community and Biodiversity A.C. (COBI)	National Autonomous University of Mexico (UNAM)

The purpose of the meeting was to begin to identify the following:

1. The impacts of land use and land use change on the marine environment in Quintana Roo.
2. The location of the impacts of land use and land use change on the marine environment in Quintana Roo.
3. The causes of the impacts of land use and land use change on the marine environment in Quintana Roo.
4. Potential solutions to overcoming any negative impacts of land use and land use change on the marine environment in Quintana Roo.

All participants took part in a series of brainstorming sessions, mapping exercises, and open discussions, with their inputs being recorded by notetakers and the workshops' facilitation team. These inputs are divided into five sections in this report, of 'Impacts', 'Impact Locations', 'Impact Causes', 'Impact consequences', and 'Solutions to negative impacts'.



**Figure 1: Round-table discussions at Bacalar workshop (Edward Hind-Ozan)**

## Impacts

Here, in table 2, the top-5 impacts of land use and land use change on the marine environment, as identified by both the Tulum and Bacalar workshop attendees are listed. The impact ranked #1 is that seen as the most significant by attendees, #2 as the second most significant, and so on. Other impacts noted by attendees to both workshops are noted at the base of the table in no particular order.

**Table 2 - Impacts of land use and land use change on marine environment**

<b>Tulum</b>	<b>Bacalar</b>
1. Groundwater contamination*	1. Groundwater contamination**
2. Lack of governance	2. Poor environmental legislation***
3. Disappearance of vegetation	3. The dominant development model
4. Inadequate management of solid waste	=4. Deforestation****
5. Low cooperation between policy-makers, society, and developers	=4. Inadequate management of solid waste
<p><b>Other impacts:</b> land use and land tenure change; pollution of karstic aquifer with raw sewage; unplanned urban growth (new housing and tourist developments); failure of establishment institutions to follow up on issues; lack of capacity and adequate procedures; lack of rainwater separation; intensive coastal development by federal government regardless of ecological conditions; saltwater intrusion; artificial modification of the coastline (e.g. land reclamation); human-induced erosion; use of chemicals by gardeners in the tourist industry; little planting of native plants within tourist developments; failure to evaluate cumulative impacts; lack of planning, infrastructure, and budget dedicated to sustainable implementation of urbanisation and tourism developments; a lack of risk maps; ZOFEMAT (Zona Federal Marítimo Terrestre) are not assigned to budget management (i.e. there is noncompliance due to a lack of supervision by authorities); bad construction practices negatively impacting dunes, cenotes, and caves; bad tourism practices (e.g. dune destruction; chemical releases); environmental impacts on the coastline; extraction of stone; impact of household cleaning products; destruction of water flows by roads; destruction of coastal dunes; lack of an environmental culture; impacts of intensive agriculture and agrochemicals; broken connectivity between ecosystems caused by development of infrastructure (e.g. roads) along coast; impact of vegetation burning to clear land for alternative use (e.g. development); urbanisation due to migration*****; lack of sanitary infrastructure coupled with urban growth; private and public conflicts over natural resources; lack of public beach and lagoon access; political interest in development by non-local developers; change of land tenure from collective (e.g. Ejido) to private; cross-border</p>	

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waste from Belize (e.g. pesticides); the magnification of impacts by the region's karstic geology; breaking of ecological corridors; improvements that have come with waste collection centres; a change in mentality of settlers on waste; apathy following disappointment that stakeholders previous recommendations have not been actioned by policy-makers; disagreement between authorities and technical committees; system is overloaded as its capacity is rarely considered.

\* Workshop participants chose to incorporate "A lack of connection between the drainage system and water treatment" into this impact, noting the similarity.

\*\* Workshop participants also incorporated "low water quality standards" and "undertreatment of residual water" with this impact.

\*\*\* Workshop participants noted that the legislation was outdated, had omissions, was erroneous, or was not applied.

\*\*\*\* And associated erosion.

\*\*\*\*\* And associated lack of community in new and recently expanded settlements.

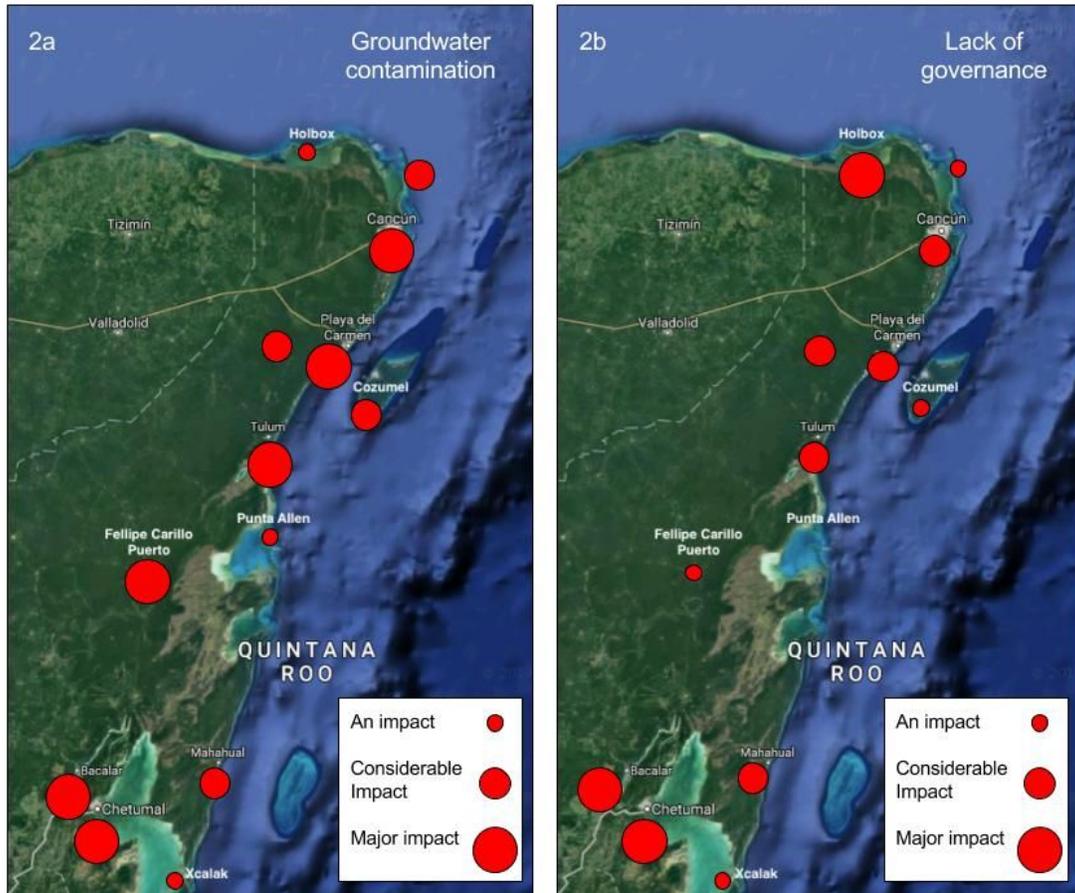
## Comments

The outputs, shown in table 2, from impact-listing activities at the two workshops show that it is almost impossible to separate impacts from their causes. Many of the impacts listed by workshop attendees could more accurately be considered causes. However, this is no bad thing. The fact that the causes were so readily volunteered shows that there is already a wide appreciation in Quintana Roo about how land use is having an impact on aquatic systems. Informed stakeholders with knowledge of the issues they are facing have a considerable head-start when it comes to mitigating and halting negative impacts of land use, while facilitating positive ones. Researchers on the Land2Coast project will likely produce more appropriate and better-targeted outputs as a result of working with and alongside such a community.

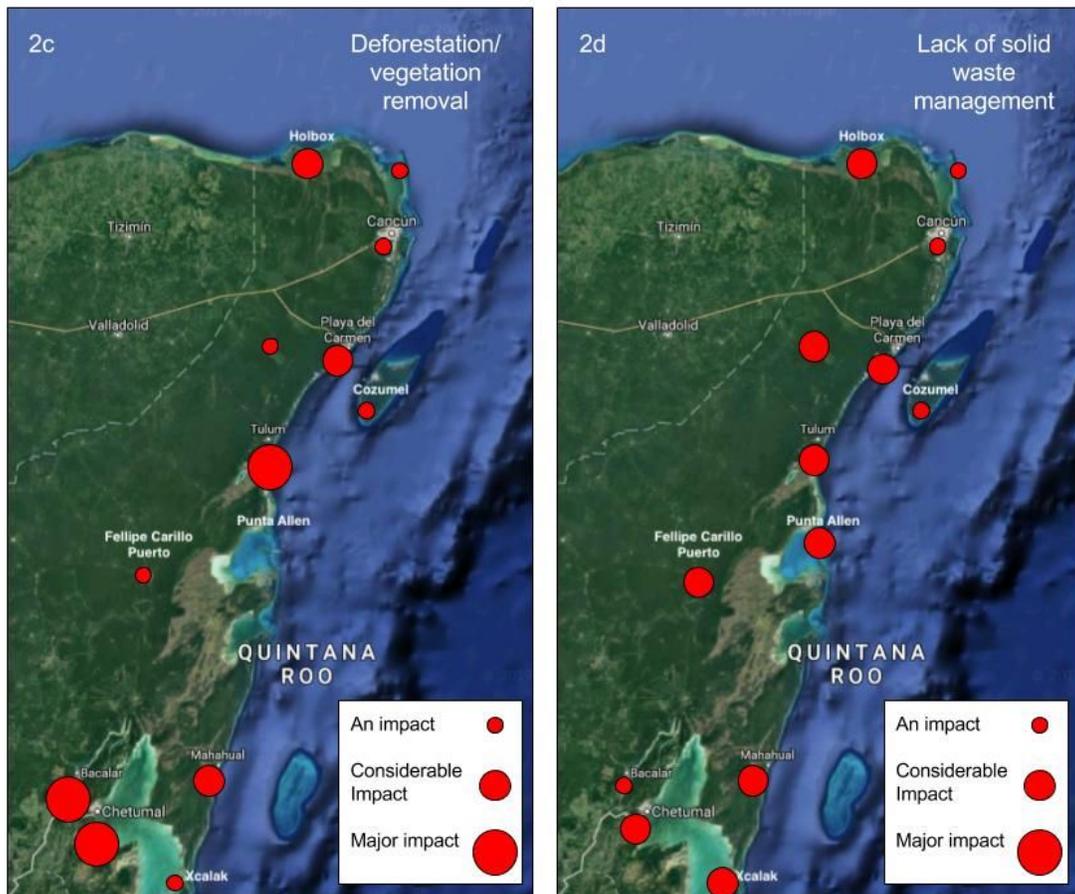
Also of note, is the centrality of water in the listed impacts. While it is true none of the invited fishing organisations could attend the workshop, the impacts primarily listed are not of a degraded marine system. They are of the degraded water quality in the Quintana Roo water table. Impacts that the Land2Coast researchers may have expected to be listed, such as reduced seafood availability and poorer quality scuba diving for tourists were not suggested by workshop attendees. Workshop attendees were highly aware of how water connects the land and ocean in Quintana Roo, and chose to focus on this overarching impact rather than some of the resultant impacts that come with poor water quality.

## Impact Locations

Part of the Land2Coast project will involve selecting sites at which to investigate the magnitude and causality of certain impacts of land use change on the marine environment. Participants at both workshops were asked to show on a map where they see the top-ranked impacts occurring. Their contributions are collated and summarised in figures 2a-2d.



**Figures 2a and 2b: Stakeholder maps of (2a) groundwater contamination and (2b) lack of governance (Map data ©2017 Google).**



**Figures 2c and 2d: Stakeholder maps of (2a) deforestation / vegetation removal and (2b) lack of solid waste management (Map data ©2017 Google).**

### Comments

Again, water is central in workshop participants mind. It is a major impact almost everywhere in Quintana Roo, whereas solid waste management seems a relatively more important issue in the newest settlements (e.g. Mahahual) and those that are rapidly expanding (e.g. Tulum). The vegetation loss in the centre of the state (Playa del Carmen - Tulum) was mostly described by stakeholders as a result of tourist development (e.g. removal of mangroves) where in the south of the state it was due to land clearance for urbanisation and some agricultural development. It was a pervasive view that lack-of-governance was statewide, although figure 2b shows Holbox and its coastal surrounds, as well as the south of the state, to be particular regions of concern.

## Impact causes

Workshop participants were asked to advance causes for the most significant ‘impacts’ identified earlier in this report (see table 2). The top causes they identified for each impact, collated for both workshops, are listed in tables 3-6.

**Table 3 - Causes of groundwater contamination**

1. A lack of / inadequate wastewater management and treatment.
2. Use and a lack of management of solid and viscous waste (e.g. gasoline) and chemicals (e.g. agricultural, cleaning materials).
3. Urban and coastal development
4. The lack of an environmental culture
5=. Lack of enforcement / authority oversight
5=. Exploitation of the aquifer by mining, tourism, and residential sectors.
<b>Other causes:</b> A lack of infrastructure for management and maintenance; land use change in sensitive / protected areas; the modification of coastal vegetation (e.g. mangroves); desalination plants and the lack of their regulation; lack of compliance with existing standards; sensitive aquifer; untreated water released into reservoir; leaching from landfill; emerging contaminants; aquaculture of shrimp and tilapia*; use of fertilizers that then increase nutrient loading in water and pesticide pollution; lack of drainage systems; mass tourism; poor urban planning; runoff from golf courses.

\*e.g. Discharge of antibiotics.

**Table 4 - Causes of lack of governance**

1. Corruption / lack of financial transparency
2. The economic development model
3. Disjointed plans and programmes
4. Apathy / lack of citizen participation / disempowered citizens
5. Lack of coordination between sectors and levels of government
<b>Other causes:</b> A lack of a desired image for the region; poor working conditions; little integration with local production / supply chains; a lack of governance alternatives; a lack of freedom of information; a lack of consultation of academia / researchers by the government; decisions are not evidence-based; a lack of appreciation of natural

ecosystem services; a lack of high-level political involvement / will; insufficient financial resources (planning not implemented as a result); inadequate fiscal regulation; government inconsistency on environmental issues; over regulation can actually prohibit governance, as it is too bureaucratic to allow law to easily be enforced (while also being expensive).

**Table 5 - Causes of deforestation / vegetation loss**

1. Lack of comprehensive and long-term land use planning*
2. land use change
3. Corruption
4. Hotel development with no concern for the environment
5. Breaking of hydrogeological legislation
<b>Other causes:</b> A lack of ecological criteria for planning; poor implementation of regulations; illegal logging; natural and deliberate fires / burning; changes in water flows**; introduction of exotic / invasive species; mining and industrial activities; land speculation; legal and illegal urbanisation.

\*e.g. Of biological corridors, urbanisation, etc.

\*\* especially to mangroves

**Table 6 - Lack of solid waste management**

1. Lack of municipal waste management plans and infrastructure*
2. Lack of consumer knowledge and education**
3. Inadequate provision of recycling plants
4. No regulations on product packaging
5. Lack of legislation for fining violators of solid waste regulations
<b>Other causes:</b> Lack of corporate social responsibility.

\*e.g. Waste collection

\*\* Including a lack of product certification for sustainable produce.

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## Comments

While there is some repetition of the information that workshop attendees contributed when listing impacts, this 'impact causes' section gives clarity over causation which was not present in the initial 'impacts' section.

## Impact Consequences

As noted in the 'impacts' section of this report, the workshops were not always effective (due to their design by the Land2Coast research team rather than the efforts of the workshop participants) in eliciting information beyond the reality that a major impact existed. Consequences of each impact were, therefore, not always clear. As the Bacalar workshop was the day after the workshop in Tulum, the workshop facilitation team made some changes to the day's schedule in order to investigate consequences of the most significant impact, groundwater contamination. They are listed in table 7.

**Table 7 - Some consequences of contaminated water (in no specific order)**

Death of sensitive species
Effects on the reproduction of aquatic organisms
Increased coral disease
Loss of beautiful scenery
Increased gastrointestinal disease (e.g. from swimming in sea)
Eutrophication of water bodies
Coliform in water bodies
Decrease in biological diversity
Decrease in usable water bodies

## Comments

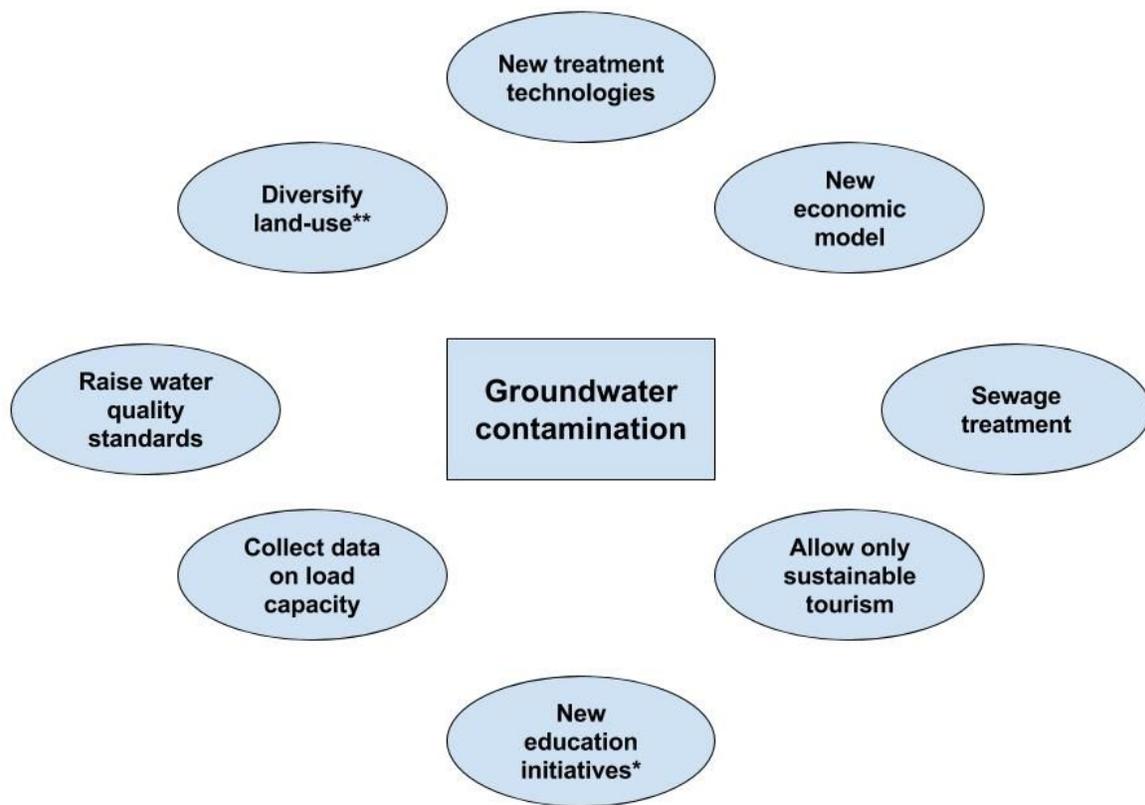
Time for this activity was short, but some important consequences of water contamination were listed by workshop participants. Undoubtedly, stakeholders present in Tulum and Bacalar could have listed numerous consequences of all of the impacts mentioned in this

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report. Land2Coast researchers must take care to fully survey stakeholders on the consequences of land use change for the marine environment in their future research in Quintana Roo.

## Solutions to negative impacts

There was time during the two workshops to begin to solicit attendees' ideas for overcoming the two most negative 'impacts' associated with land use change in relation to the marine and coastal environment. Figure 3 identifies stakeholder solutions to 'groundwater contamination', and figure 3 to 'lack of governance'.



\* To publicise existing water regulations, rights, and obligations, as well as to advertise the approach for filing concerns and complaints.

\*\* Introducing land uses more suitable to the region.

**Figure 3 - Solutions to groundwater contamination**



\* GIS = geographic information systems.

**Figure 4 - Solutions to lack of governance**

### Comments

The solutions proposed by the workshop participants are an excellent step toward making the recommendations to policy-makers that the Land2Coast research team will advance in interim and end-of-project policy briefs. During their research program they will further survey stakeholders for proposed solutions to other major impacts of land use and land use change on the coastal zone.

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## Conclusions

To finish the workshops, the facilitation team asked the attending stakeholders a number of questions to bring the day's activities together. The questions and answers given to them during open sessions were as follows:

1. *How do we overcome apathy relating to land use change governance, and how do we foster collective action?*
  - More public-private partnerships.
  - Increased communication with citizens, as well as greater dissemination of information on policy and participatory initiatives.
  - Economic stimulus for, and promotion of, civil society organisations.
  - Designing a campaign called "The Pride of Quintana Roo" and promoting it with radio advertising.
  - Support programmes to integrate policy-makers, businesses, teachers, civil society organisations, etc.
  - Set up community gardens.
2. *How do we integrate management of the land and the coastal zone? Which institutions should be involved? Which policies should be used / made?*
  - Start a platform for monitoring and evaluation the effectiveness of natural resource management.
  - Align with policies such as Local Environmental Management Programs [POEL], Protected National Areas [ANPs], the National Urban Development Program [PDU], etc.
  - Involve government, the private sector, education sector and academia, and all relevant institutions (e.g. Secretariat of the Marine [SEMAR], Ministry of the Environment and Natural Resources [SEMARNAT], Secretariat of Agrarian, Territorial and Urban Development [SEDATU], CONAGUA, SEMA, Environmental Protection Area [PPA], the Ministry of Health [SS], Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food [SAGARPA], National Commission of Aquaculture and Fisheries [CONAPESCA], the National Forestry Commission [CONAFOR], the Federal Office of Environmental Protection [PROFEPA], etc.).
  - Publish material on coastal development and climate change.
  - Implement a sustainable land use development programme.
  - Set up / use a local water catchment committee.
  - Declare Quintana Roo a hydrogeological reserve.
3. *What issues and themes should the Land2Coast project address?*
  - Prevention of contamination
  - Inter-generational perspectives
  - Legislation for integrated coastal zone management

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- Financing
  - Cultural identity
  - Valuation and integration of ecosystem services
  - Climate change mitigation
  - Rural and Mayan communities

Finally, it should be noted that the Land2Coast team are indebted to the stakeholders who attended the workshops in Tulum and Bacalar. Their strong contributions will enable more informed investigation by those working on the project, helping researchers to better target their fieldwork programme and the dissemination of their findings.

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To keep up-to-date with the progress of the Land2Coast project and to find contact details for the research team, please visit the project website.

[www.land2coast.com](http://www.land2coast.com)

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