



JNCC Report

No. 549

**Understanding our islands: how to get the best out of our GIS and our data
Workshop Report**

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Partner and participant logos

 <p>Joint Nature Conservation Committee</p>	 <p>Turks and Caicos Islands Government</p>	 <p>Department of Environment and Maritime Affairs Turks and Caicos Islands Government</p>	 <p>Survey and Mapping Department Turks and Caicos Islands Government</p>
 <p>South Atlantic Environmental Research Institute</p>	 <p>Department of Environment Government of Gibraltar</p>	 <p>Department of Environment Cayman Islands Government</p>	 <p>Department of Environment Cayman Islands Government</p>
 <p>National Oceanography Centre</p>	 <p>Foreign & Commonwealth Office</p>	 <p>British Virgin Islands Government Conservation and Fisheries Department</p>	 <p>Department of Disaster Management Government of Anguilla</p>
 <p>Department of Physical Planning Government of Anguilla</p>	 <p>GOVERNMENT OF BERMUDA</p> <p>Department of Conservation Services Government of Bermuda</p>		

Flags of Participating Overseas Territories

 Turks and Caicos	 Gibraltar	 Anguilla	 Bermuda
 British Virgin Islands	 Cayman Islands	 Falkland islands	

Workshop facilitator

Tara Pelembe - JNCC

Acknowledgements

The workshop would not have happened without the enthusiasm and support of the host Turks and Caicos Islands Government.

The Local Organizing Committee was instrumental led by the Chair Dr Eric Salamanca with invaluable support from members Alexander McLeod and Bryan Manco.

We appreciate the support and participation of HE Gov Peter Beckingham and the Governor's Office staff.

The support of the Permanent Secretary of the Ministry of Environment and Home Affairs, Mrs Susan Malcolm, and the Acting Director of the Department of Environment and Maritime Affairs, Henry Wilson, are acknowledged. We also acknowledge the support provided by FORTIS TCI.

The resource speakers Katie, Ilaria, Steve and Alan provided guidance throughout the week-long meeting/training.

Participation and presentations came also UKOT government participants from Anguilla, Bermuda, British Virgin Island, Cayman, Falklands Island, and Gibraltar and representatives and selected staff from TCIG - Survey and Mapping, Planning Department, DDME, DEMA.

JNCC funded and co-ordinated the meeting.



Figure 1. Workshop participants at the Department of Environment and Maritime Affairs office - Turks and Caicos Islands

Contents

1	Background and Policy context.....	1
1.1	Links to other JNCC OT projects.....	1
2	Collaboration.....	2
3	Workshop 1: Turks and Caicos Islands GIS and data Training Workshop.....	2
3.1	Aims.....	2
4	Participation.....	2
5	Structure and content of the workshop.....	2
5.1	Programme Presentations and training materials.....	3
5.2	Key messages.....	3
5.3	Participant feedback.....	3
6	Workshop 2 : UKOT Caribbean QGIS and data management Workshop.....	5
6.1	Aims.....	5
6.2	Outputs.....	5
6.3	Participation.....	5
6.4	Structure and content of the workshop.....	6
6.5	Programme and Presentations.....	6
6.6	Key messages.....	6
6.7	Outputs.....	7
6.8	Participant feedback.....	7
7	Field trip.....	8
8	Overall Conclusions and next steps.....	8
	Annex 1: Workshop 1 Participants list.....	9
	Annex 2: Participant expectations and issues to be addressed during Workshop 1 ..	10
	Annex 3: The framework: People, data, systems	12
	Annex 4: Workshop 1 Programme.....	13
	Annex 5: Workshop 1 ‘raw’ list of key messages	15
	Annex 6: Workshop 2 Participants list.	16
	Annex 7: Workshop 2 Programme.....	17
	Annex 8: Workshop 2 ‘raw’ list of key messages	20
	Annex 9: OT GIS data sets – what we have already and what we need	21
	Annex 10: Additional information and reference material	23
	Annex 11: Visions and strategies.	24

1 Background and Policy context

One of the strategic priorities for UK Government action identified in the 2009 United Kingdom [Overseas Territories Biodiversity Strategy](#) is *'obtaining data on the location and status of biodiversity interests and the human activities affecting biodiversity to inform the preparation of policies and management plans (including baseline survey and subsequent monitoring).'*

In the 2012 White paper 'The Overseas Territories, Security, success and sustainability' Sharing Experience of {Economic} Diversification was highlighted: *'Territory Governments have between them a wealth of experience in delivering successful economic diversification, which the UK Government encourages the Territories to share with each other. The Falkland Islands, for example, has experience of establishing a system of fishing licenses from which Territories with under-exploited fisheries can learn'.*

In the 2013 Overseas Territories [Joint Ministerial Communiqué](#), one of the priorities identified was *establishing workshops in order to assist Territory Governments in capacity-building, technical assistance and renewable energy financing;*

During the last [UKOT Biodiversity Strategy Review Meeting](#), held at KEW, March 2013, OT government participants expressed a desire for broader based contacts with UK Government experts, particularly within Defra and its family of agencies. Specific issues to be addressed related to technical assistance, capacity building, resources, and an improved network with UK expertise were identified as critical components for progress in careful planning and implementation of necessary conservation actions.

In an attempt to address some of these aspects of the White Paper, the UKOT Biodiversity strategy, the JMC Communiqué priorities, and the UKOT Biodiversity review priorities in, a series of technical workshops have been implemented and facilitated by JNCC.

One of these workshops was held in [Gibraltar in 2012](#) where OT and UK GIS experts came to share GIS experience and relevant software, and initiate a strategy for development of GIS based approaches to environmental management in the UK's OTs and Crown Dependencies. The Territories expressed a wish to meet again to finalize an OT/CD strategy, including use of these systems in ecosystem assessments, economic evaluations and data management. **These TCI workshops follow up on this request**

The TCI workshops focus on addressing the issue of better access to data, and the provision of training for spatial data management through cross-territory skill-share, and developing links with UK technical expertise.

1.1 Links to other JNCC OT projects

In a broader approach to facilitating better access to, and use of existing data to provide a sound environmental evidence-base to feed into decision-making, JNCC has recently initiated a project looking at [data access across the UK Overseas Territories](#).

The Foreign and Commonwealth Office (FCO) has also funded JNCC to develop UKOT data management initiatives specifically the [South Atlantic Information management centre](#). This model was presented at the Turks and Caicos Islands workshop.

JNCC, with funding from the Foreign and Commonwealth office (FCO) has also been working on implementing a suite of [Green Economy/Environmental mainstreaming projects](#) across the OTs. These projects have been initiated to address one of the priorities of the

[2012 JMC Communiqué](#) i.e. *to take a more strategic approach to the management, protection and conservation of the natural environment, including embedding that understanding into Government policies and decision-making;*

Currently a Green economy project is being run in the **Turks and Caicos islands** which aims to *“identify those short, medium and long term actions necessary to establish a common understanding of what is needed to mainstream environmental issues into the planning processes of the Turks and Caicos Islands including identifying barriers to action and possible ways to overcome these”*

The GIS and data workshops complement the Green Economy Project in that they develop skills and systems for the provision of evidence to feed into the Green Economy process.

2 Collaboration

The workshops were designed and delivered through a collaboration of 14 organizations, as referenced in the acknowledgements and through the partner logos. Regular correspondence and meetings of the workshop organizing group provided the forum for discussion and decision on workshop content, focus, logistics etc. This was then fed out to the wider group of participants. The members of the workshop organizing group were Tara Pelembe, Eric Salamanca, Alexander McCleoud, Katie Medcalf, and Illaria Marengo.

3 Workshop 1: Turks and Caicos Islands GIS and data Training Workshop

3.1 Aims

Workshop 1 was focused on training participants from the Turks and Caicos Islands government in data share, data management and the use of QGIS. Its aims were:

- To understand the principles of data share and data management.
- To understand how GIS can be utilised by more staff in TCI to assist your day to day work.
- To introduce how open source solutions can work with Arc GIS and discuss advantages of having data available in a suitable form for all to access
- To demonstrate the use of GIS for policy analysis to include:
 - the way GIS can be effective in supporting the evaluation of the EIA
 - how to design ground-truthing for evidence evaluation
 - Consideration of modelling habitat suitability for different species.

4 Participation

Participants came from a number of government departments within the Turks and Caicos Islands. The participants list is provided in [Annex 1](#).

5 Structure and content of the workshop

The content of the workshop programme was derived from meetings of the organizing group, and from workshop preparation questionnaires where participants were asked to identify the areas where they required training/technical/expert advice and to identify their expectations of the workshop. [Annex 2](#) summarizes some of the questionnaire results.

The nature of the workshop was such that the programme was flexible and adapted to suit the emerging needs of the participants. The workshop was structured to enable training sessions, and discussions. Where focused specific technical advice was requested, opportunities for one-one support were provided through afternoon 'clinic' sessions. In addition, daily key messages were collectively identified.

The overarching framework for the approach to data management that was promoted during the workshop was one that identified and considered the three components of data management 'people' 'data' and 'systems' (see [Annex 3](#))

5.1 Programme Presentations and training materials

The programme for workshop 1 is available in [Annex 4](#)

QGIS Training materials were developed by Environment Systems, and are available via the links

- Part 1: Using QGIS
- Part 2: Layouts and preparing maps for printing
- Acquiring and importing data from GBIF

These and other presentations are [available on the report webpage](#).

5.2 Key messages

Each day, the participants identified key messages that they had identified from the training and discussions during the workshop. The level of these messages varies from the specific to the strategic and the 'raw' messages, as identified by the workshop participants through consultation groups are outlined in [Annex 5](#). The key concepts captured by these messages are:

People: People and their knowledge are valuable and should be valued. Everyone needs to know the importance of data and GIS. There needs to be high level support for GIS and for increased transparency and communication across departments. The younger generation has a positive influence on change and use of technology and data share and this is something that should be tapped in to and channeled. Spatial data should be presented via GIS and fed into planning and decision-making so that there is a visual understanding of the impact of decisions being made.

Data: As well as collecting data we need to analyze data to make it useful to the end users.

Systems: Some departments are resource-poor and don't have the basic hardware (including computers and laptops) to be able to facilitate the setting up of an effective data management system. Hardware, and links with IT are vital. There should be an central database/system/bank where everyone uploads their data and information in an agreed format/standard so that it is accessible by all.

5.3 Participant feedback

Participants were provided with a training workshop feedback form. The general feedback indicated the workshop was seen as positive and was an important opportunity to develop knowledge, expertise and share experience and ideas. A summary of the results of the feedback are presented here:

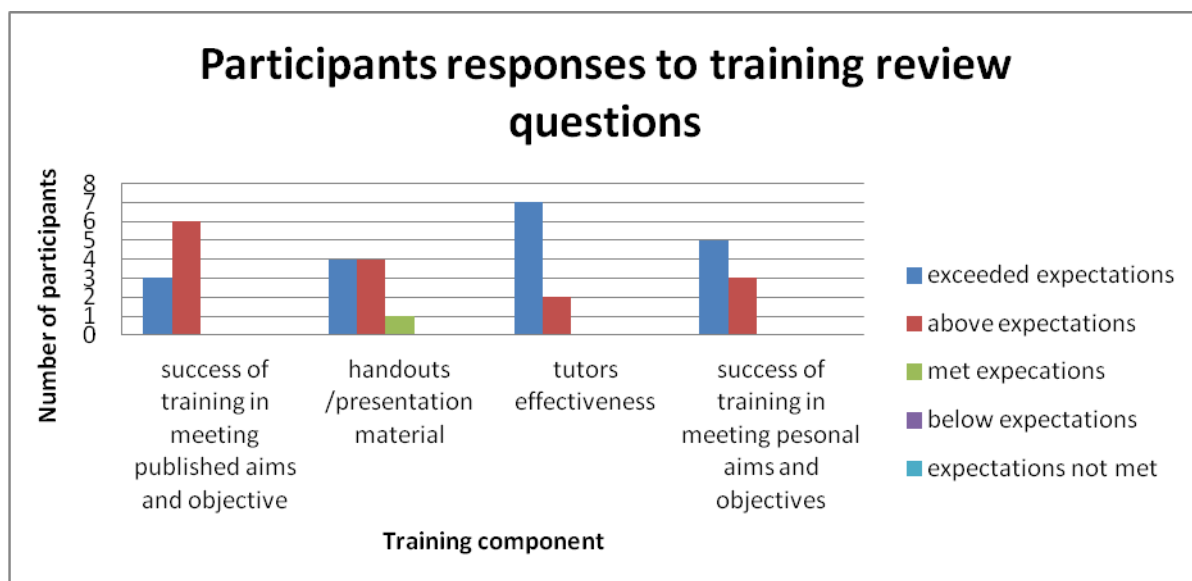


Figure 2. Participant responses to training review questions.

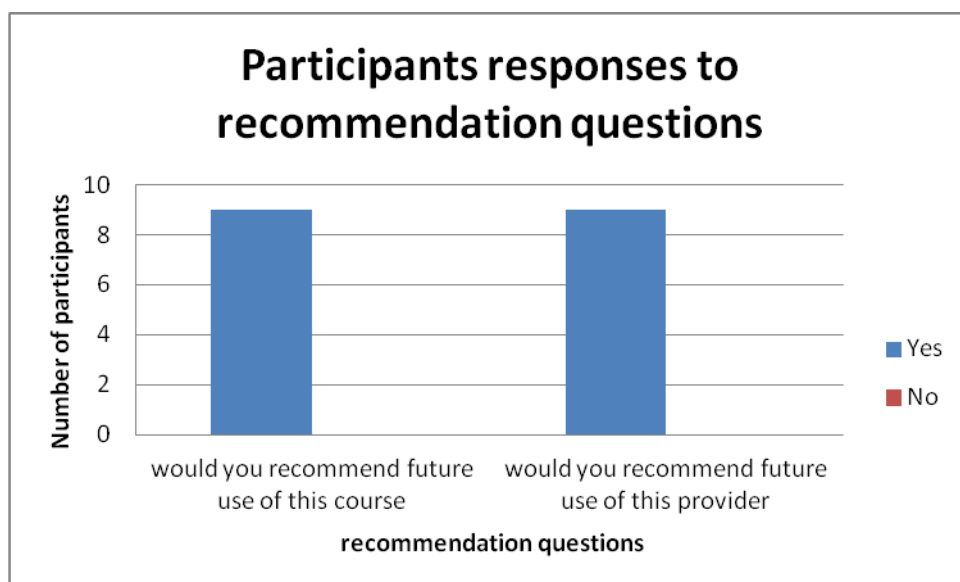


Figure 3. Participant responses to recommendation questions.

Positive comments included

- Very informative, only wish other members from my department were present.
- Resource persons are excellent, qualified and experienced.
- Very informative course and I have gathered a lot of information to take back to TCIG.
- The course provides an opportunity to improve data management and environmental sustainability in TCI.
- QGIS is great.
- Training has allowed me to get a better understanding of data that is available locally!!
- The discussions were extremely useful - I appreciated the flexibility and the opportunities provided to discuss individual issues/ideas.

There were some detailed points raised by participants on areas that could be improved or required follow-up:

- Some tutorials went a bit too fast - participants are watching two screens while presenter is watching one.
- Conduct follow-up training.
- Looking forward to continued work and support.

These points will be followed up post workshop, and have been added to the action plans of relevant organizations.

In summary, the training workshop appears to have been seen by participants as being very useful, and had positive benefits that went beyond the actual development of QGIS skills to include wider 'softer' benefits such as inter-departmental collaboration.

6 Workshop 2: UKOT Caribbean QGIS and data management Workshop

6.1 Aims

Workshop 2 was focussed on sharing best practice in data management, and developing QGIS skills for participants from the Turks and Caicos Islands, the other Caribbean UKOTs, with participation from Gibraltar and the Falklands providing links to other UKOT regions and previous similar themed workshops and current data management projects. Its aims were:

- To bring together GIS and data specialists from the Caribbean Overseas Territories to share experiences and expertise and to explore options and opportunities for synergy and collaboration.
- To build on the Data management/GIS Strategy discussions in Gibraltar to discuss use of GIS across all of the OTs/CDs; and to develop a GIS and data strategy identifying short term gains and longer term benefits.
- To understand how a GIS/biodiversity data management strategy needs to consider: Data, People and Systems.
- To examine in depth where we are and how to move forwards towards an action plan to implement an OT GIS/data strategy and to take forward this best practice in each Island.

6.2 Outputs

This workshop was ambitious in its vision for outputs – which was described as follows:

- Development of a GIS strategy and a practical work plan for each participating island to ensure effective, and increasing, GIS use and data management/access in addressing environmental management issues including identification of software, training and external support needs and how these should be met to include:
 - identification of specific applications of GIS in the OTs (for example habitat mapping, economic evaluation, development of management plans)

6.3 Participation

Participants came from a number of government departments within the Turks and Caicos Islands, and other Overseas Territories. The participants list is provided in [Annex 6](#).

6.4 Structure and content of the workshop

The process for agreeing the structure and the content of this workshop was the same as that for workshop 1. The content of the workshop programme was also derived from meetings of the organizing group, and from workshop preparation questionnaires where participants were asked to identify the areas where they required training/technical/expert advice. These are provided in [Annex 2](#).

The nature of the workshop was such that the programme was flexible and adapted to suit the emerging needs of the participants.

To take full advantage of the expertise and experience derived from bringing together participants from a range of OTs and TCI government departments, the programme included opportunities for case studies and presentations from each of the OTs represented and some of the TCI government departments.

6.5 Programme and Presentations

The programme for workshop 2 is available in [Annex 7](#). This workshop also used the [people, data, systems framework](#) presented in the first workshop.

The presentations and supporting materials used in workshop 2 are [available on the report webpage](#).

6.6 Key messages

Each day, the participants identified key messages that they had identified from the training and discussions during the workshop. The level of these messages vary from the specific to the strategic and they are presented here are a summary of the messages identified. The 'raw' versions are captured in [Annex 8](#).

The essences of the key messages from the workshop were:

- Keep the systems simple and understandable to a large number of people to ensure use and sustainability.
- Some of the case studies show that small territories or islands with strong IT sectors and manage nearly all government data transparently and efficiently with a very small team.
- It is essential to have a data management policy, and established local data standards that are ideally on par with international standards e.g. INSPIRE.
- Everyone needs to work as a team towards a common goal and vision. It is important to have good communication and collaboration. The examples of cross-sector GIS working groups were seen as good platforms for encouraging this collaboration, and it was noted that it is important that they include IT staff.

In addition to the key messages, the workshop preparation and process resulted in the compilation of a list of data sets for some of the OTs. These have been captured in [Annex 9](#). In the case of TCI this was developed to the beginning of a metadata catalogue which will be hosted by the Department of Survey and Mapping. In addition guidance on creating a metadata catalogue was shared (document [available on the report webpage](#)).

6.7 Outputs

There were a number of outputs from the event - some key ones are highlighted here:

- Each participant developed a personal **action plan** to deliver some of the key actions to take forward generally relating to them sharing with others, implementing lessons learnt and/or developing project proposals to take forward larger projects that require funding. This was translated into a workplan to follow up on the event (document [available on the report webpage](#)).
- There was some [local media coverage](#) .
- In addition to the case studies presented, **additional related information** and reference material was collated and shared ([Annex 10](#))
- Although initial planning proposed that a '**GIS strategy**' was developed as a workshop output, discussions during the event indicated that a collective strategy was not an immediate requirement. Each OT present considered and shared what their vision for data management on their island is, and a very draft idea for a strategy for using data to influence policy and decision-making in TCI was floated. The detail on these is included in [Annex 11](#). In addition, some OTs present already had GIS strategies and there was a commitment to share these with all participants.

6.8 Participant feedback

Participants were provided with a training workshop feedback form. A summary of the results of the feedback are presented here:

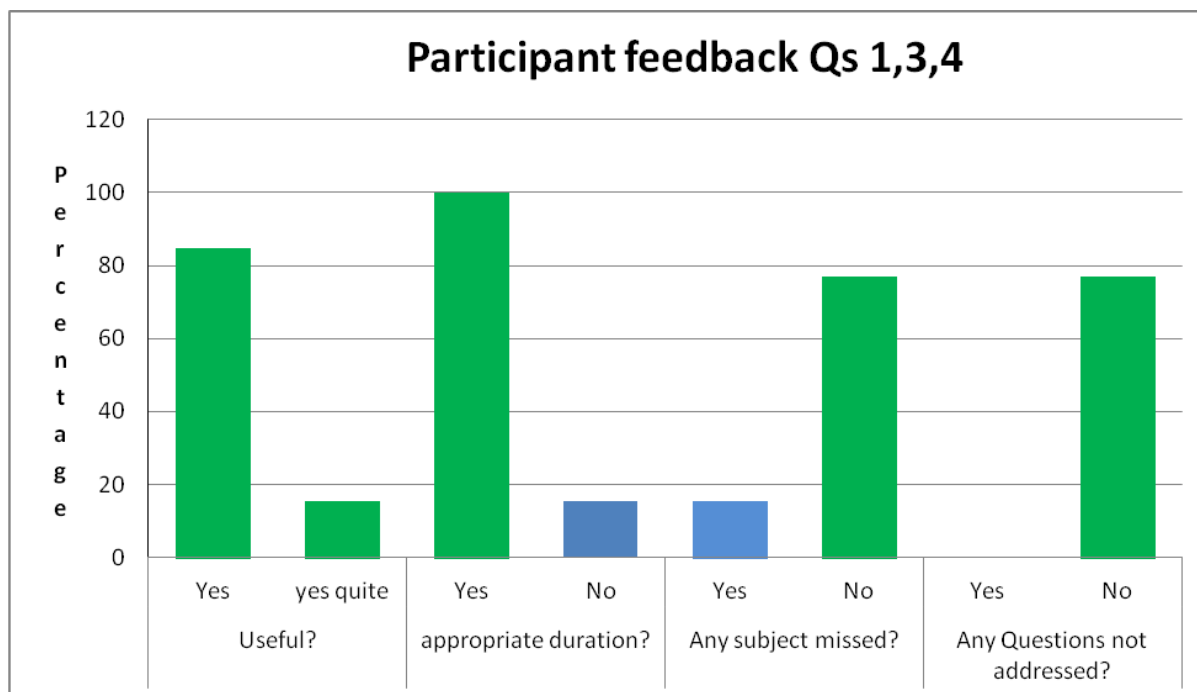


Figure 4. Participant feedback on questions 1,3 and 4.

100% of the participants found the workshop useful, and confirmed that it was the correct length. C. 80% thought it included all the subjects required, and all of their questions were addressed. The areas that were identified as 'missed' were a possible IT presence at the workshop and more practical use of the QGIS programme.

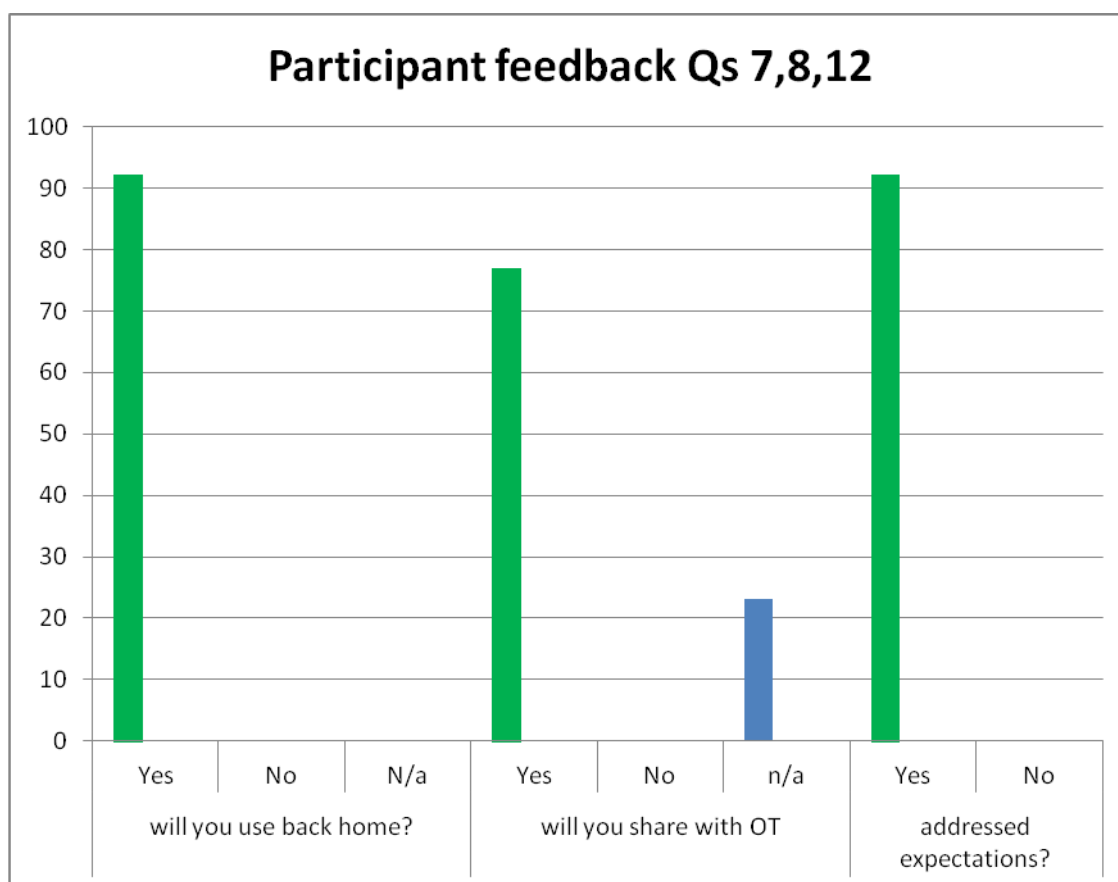


Figure 5. Participant feedback on questions 7, 8 and 12.

Over 90% of the participants confirmed that the workshop had addressed their expectations and they would use their training back home.

7 Field trip

The Turks and Caicos Islands Government Department of Environment and Maritime Affairs organized a field trip for the international participants. It was an opportunity to ‘ground truth’ some of the maps that had been presented in the workshop, and included a visit to the Caicos Pine Project controlled burn site and the endemic plant nursery. It was an excellent day, that provided important context for the earlier discussions and presentations.

8 Overall Conclusions and next steps

Most of the aims of the workshop was addressed, and this report provides the key messages that were identified by this group of delegates. Some areas of additional required expertise were identified and JNCC will work with the relevant OT governments to deliver these.

There were some very concrete opportunities for synergy identified for all of the four workshops and participants, and JNCC will work towards developing and implementing these.

Annex 1: Workshop 1 Participants list

Name	Country	Organisation	Job title
Illaria Marengo	Falklands	South Atlantic Environmental Research Institute (SAERI)	Project manager – GIS specialist
Alexander MCleod	Turks and Caicos Islands	TCIG - DEMA	Environmental Officer-PLS, DEMA
Bryan Manco	Turks and Caicos Islands	TCIG - DEMA	Caicos Pine Project Manager, DEMA
Demarco Williams	Turks and Caicos Islands	TCIG -Survey and Mapping Department	Survey and Mapping Dept.
Eric F. Salamanca	Turks and Caicos Islands	TCIG - DEMA	Asst. Director for R&D, DEMA
Gervin Simmons	Turks and Caicos Islands	TCIG -Survey and Mapping Department	Survey and Mapping Dept.
Idi Gardiner	Turks and Caicos Islands	TCIG - DEMA	Senior Conservation Officer, DEMA
Katharine Hart	Turks and Caicos Islands	TCIG - DEMA	Environmental Officer-GDT, DEMA
Luc Clerveaux	Turks and Caicos Islands	TCIG - DEMA	Environmental Officer-XSC, DEMA
Mike Clerveaux	Turks and Caicos Islands	TCIG - Planning Department	Land-use Planner, Planning Dept.
Ricardia Pardo	Turks and Caicos Islands	TCIG - Disaster management and emergency	Disaster Management and Emergency
Rodney Smith	Turks and Caicos Islands	TCIG - DEMA	Conservation Officer, DEMA
Alan Evans	United Kingdom	National Oceanographic Centre	Senior Scientist (UNCLOS)
Katie Medcalf	United Kingdom	Environment systems	Environment Director
Steve Wilkinson	United Kingdom	Joint Nature Conservation Committee	Head of Data Services
Tara Pelembe	United Kingdom	Joint Nature Conservation Committee	Senior Overseas Territories Adviser

Annex 2: Participant expectations and issues to be addressed during Workshop 1

OT Biodiversity data access questionnaire

Q16 What specific GIS issues would you like to have expert advice on at the workshop?

Answered: 8 Skipped: 18

#	Responses	Date
1	Marine LIDAR acquisition options, QGIS capabilities	1/28/2015 2:29 PM
2	QGIS	1/28/2015 1:48 AM
3	Determine suitability of the program for our project work	1/26/2015 6:44 AM
4	Fisheries and GIS	1/25/2015 1:52 PM
5	Water quality mapping,	1/23/2015 11:53 AM
6	I want to migrate to QGIS from ArcGIS 9.3. I have basic knowledge on GIS	1/23/2015 9:44 AM
7	Data sharing and data management	1/22/2015 11:23 AM
8	The important's of surveying and data collecting to GIS.	1/19/2015 12:46 PM

Q17 What do you see as the main issues/risks/challenges that you face?

Answered: 10 Skipped: 16

#	Responses	Date
1	Funding for major projects	1/28/2015 2:29 PM
2	communicating the technical jargon to my more GIS competent colleagues	1/28/2015 11:26 AM
3	Having been trained in ArcGIS previously but not really using it, my biggest concern is whether the program realistically addresses my project's needs better than the current Google Earth methods we are using.	1/26/2015 6:44 AM
4	Human resources, Equipment, Budgetary, Cooperation from Government officials	1/23/2015 11:53 AM
5	I need hands-on training in QGIS	1/23/2015 9:44 AM
6	There is no position or department within the Bermuda Government that is mandated to manage and maintain our GIS. We have a GIS Committee, made up of GIS users, who do our best to keep developing our GIS but we all have other job responsibilities and cannot completely focus on the Bermuda Governments GIS as a whole.	1/22/2015 11:23 AM
7	Data sourcing	1/20/2015 10:55 AM
8	Lack of data, such as, hazard, climate, biodiversity and habitat	1/20/2015 7:19 AM
9	Management fail to utilize GIS to its maximum potential	1/20/2015 5:37 AM
10	To many data holder or have to many copies of data.	1/19/2015 12:46 PM

Workshop 1 - Expectations

- Learn more about a free GIS software and rekindle my memory of GIS.
- Find out whether QGIS is useful to the project I manage.
- To work with the public sector to integrate GIS data into decision-making.
- See whether I can remember/retain this GIS programmes operation.
- Be able to transfer to the other what has been done so far in the South Atlantic, perhaps can be useful and helpful.
- To understand the GIS systems extent in TCI.
- Centralised data programme.
- Build GIS knowledge.
- Learn a new GIS software.
- Familiarise myself with the software.
- How to incorporate ArcGIS data with QGIS.
- Understand what marine activities TCI up to.
- Inform TCI of an area of law that could be of great benefit.
- Better understanding of technical issues and what JNCC can do to help.
- To learn how to better handle data.
- Learn how to use QGIS.
- Better working knowledge of GIS and its application in TCI.
- Learn QGIS to help improve data management.
- Questions during meeting.
- How to get data into QGIS.

Annex 3: The framework: People, data, systems

	People		Data	systems	Tools
	Users	Providers			
OT-based		skills	partnerships		
		ArcGIS QGIS	Cross departmental /organisational working	Spatial data (e.g habitats + species)	central spatial data system (e.g. SHEIS) ArcGIS QGIS
		Access Excel		Non spatial data (e.g species)	central database (e.g. Biological records) access excel
		Access Excel		monitoring data	Central monitoring database access excel
International				Spatial data (e.g habitats + species)	central spatial data system - ALA
				Non spatial data (e.g species)	central database - GBIF
				monitoring data	OT monitoring database ??

Annex 4: Workshop 1 Programme

Monday 2nd February: Why do we need GIS and how do we use it?

An introduction to and training in GIS.

Time	Session title	Lead
08:30 – 09:00	Coffee and networking	
09:00 am – 09:30 am	Welcome, Introductions, the purpose of the workshop	TCIG + JNCC (Tara Pelembe)
09:30 – 10:00	Introduction to using GIS for viewing, exploring and modelling scenarios	Katie Medcalf.
10:00 – 10:15	Break	
10:15 – 10:50	Familiarisation with QGIS viewing data	Katie Medcalf iLaria Marengo
10:50 – 11:05 11:05- 11:30	GIS in Planning an overview practical doing simple analysis	Katie Medcalf
11:30 – 11:50	The Environmental Impact Assessment process in TCI -	Eric Salamanca
11:50 – 12:30	Using GIS for scenario planning	Katie Medcalf.
12:30 – 13:30	Lunch	
13:30 – 14:00	Practical session.	
14:00 – 14:20	Using GIS for planning field campaigns.	Steve Wilkinson
14:20 – 14:50	Practical session to include: <ul style="list-style-type: none"> • sampling points • feeding in and cleaning GPS data 	iLaria Marengo
15:00 – 15:15	Break	
15:15 – 16:00	Practical session to include: <ul style="list-style-type: none"> • Modelling habitat suitability. 	iLaria / Katie
16:00 – 16:30	Key messages	ALL

Day 2: Monday 2nd February - How to enable GIS use in the Turks and Caicos Islands.

Resources:

- All participants to bring laptop – GIS programme to be downloaded onto laptop during breaks/lunch (instructions circulated at beginning of meeting)
- List of layers to be produced so that all participants can see what spatial data is available for TCI.

Time	Session title	Lead
08:30 – 08:40	Welcome and introduction to the day	Tara Pelembe
09:00 am – 09:30 am	Practical demonstration of GIS use in planning from Anguilla National Ecosystem Assessment and the South Atlantic Environment Research Institute.	Katie Medcalf/Ilaria Marengo.
09:30 – 10:00	What do you need data for? What big questions/policy issues do you have that it would be good to have spatial data for? Who needs the data?	KatieMedcalf/Ilaria Marengo.
10:00 – 10:15	Break	
10:15 – 10:50	What TCI data do other organisations hold? Case study – National Oceanographic Centre	Alan Evans.
10:50 – 11:10	Tools for keeping track of who has what – case study: the metadata catalogue for the South Atlantic Overseas Territories	Ilaria Marengo.
11:10 – 12:00	Over to you – what data do you have? Towards a TCI metadata catalogue.	Tara Pelembe
12:00 – 12:30	What data that you currently have that could help answer some of the big questions?	Katie Medcalf.
12:30 – 13:30	Lunch	
13:30 – 14:30	Practical session. How to present the data – making maps.	Katie Medcalf/Ilaria Marengo.
14:30 – 15:00	Case study of a system are available for how the data can be accessed, shared etc. The South Atlantic Overseas Territories Information Management Centre.	Illaria Marengo
15:00 – 15:15	Break	
15:15 – 16:00	Visioning – where would we like to be?	Tara Pelembe
16:00 – 16:30	Key messages	ALL

Annex 5: Workshop 1 ‘raw’ list of key messages

People

- Older knowledge valuable – especially from other islands.
- Community buy-in important.
- B1 People at all levels – understanding, interaction, sharing.
- R1 Top level (politicians) buy-in and heads of department to understand the potential of GIS.
- Why do we need data? Everyone needs to know the importance of GIS and data:
 - Everyone thinks everyone knows where everything is – but you can forget/need reminders.
 - Seeing is believing.
 - Changes over time can be seen with maps.
 - Illegal development can be seen better with maps.
- Young generation positive change.
- Transparency and communication across departments.
- Education.
- Zero tolerance of contravention.

Data

- We need to analyse data.

Systems

- G3 QGIS can be used in many departments because it is free and user friendly.
- Need to invest – no equipment (computers, hardware software). Need to tackle infrastructure policy – includes people, data.
- R2 G1 needs resources in equipment – hard most laptops – field work equipment - software, lots of older computers that can't hold raster data sets.
- G2 Online database/system/bank where everyone uploads and information is usable for everyone – government, private sector and researchers.
- B2 Need to know what data we have – includes data, software, hardware.
- Need central data management system.
- GIS – how we need to share data – how to use data appropriately – copyrights.
- R3 Central data management system so that all can share and every department has equal access & appropriate.
- Multi-stakeholder data sharing.
- Island sharing – fragmentation is a big issue.
- B3. Need to tackle infrastructure.

Note – for action/implementation already on the way: Dept of survey and mapping are developing a central GIS – with a GIS server – where all other departments will be able to access data via a data sharing policy (that will be a legal policy and will include copyright) which will be in place by September this year.

Annex 6: Workshop 2 Participants list

Name	Country	Organisation	Job title
Calvin Samuel	Anguilla	Government of Anguilla - Department of Environment	
Mandy Shaler	Bermuda	Bermuda Government	GIS Mapping Analyst
Rozina Norris-Gumbs	British Virgin Islands	BVI government - Conservation and Fisheries Department	Geographical Information Systems Officer
Jeremy Olynik	Cayman Islands	Cayman Islands Government - department of environment	Geographic Information Systems Officer
Illaria Marengo	Falklands	South Atlantic Environmental Research Institute (SAERI)	Project manager – GIS specialist
Stephen Warr	Gibraltar	Gibraltar Government	Senior Environment Officer
Alexander MCleod	Turks and Caicos Islands	TCIG - DEMA	Environmental Officer-PLS, DEMA
Bryan Manco	Turks and Caicos Islands	TCIG - DEMA	Caicos Pine Project Manager, DEMA
Demarco Williams	Turks and Caicos Islands	TCIG -Survey and Mapping Department	Survey and Mapping Dept.
Eric F. Salamanca	Turks and Caicos Islands	TCIG - DEMA	Asst. Director for R&D, DEMA
Gervin Simmons	Turks and Caicos Islands	TCIG -Survey and Mapping Department	Survey and Mapping Dept.
Idi Gardiner	Turks and Caicos Islands	TCIG - DEMA	Senior Conservation Officer, DEMA
Katharine Hart	Turks and Caicos Islands	TCIG - DEMA	Environmental Officer-GDT, DEMA
Luc Clerveaux	Turks and Caicos Islands	TCIG - DEMA	Environmental Officer-XSC, DEMA
Mike Clerveaux	Turks and Caicos Islands	TCIG - Planning Department	Land-use Planner, Planning Dept.
Ricardia Pardo	Turks and Caicos Islands	TCIG - Disaster management and emergency	Disaster Management and Emergency
Rodney Smith	Turks and Caicos Islands	TCIG - DEMA	Conservation Officer, DEMA
Alan Evans	United Kingdom	National Oceanographic Centre	Senior Scientist (UNCLOS)
Katie Medcalf	United Kingdom	Environment systems	Environment Director
Steve Wilkinson	United Kingdom	Joint Nature Conservation Committee	Head of Data Services
Tara Pelembe	United Kingdom	Joint Nature Conservation Committee	Senior Overseas Territories Adviser

Annex 7: Workshop 2 Programme

Wednesday 4th February – An overview and a focus on People

People	Data	Systems
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Setting the scene, the overall framework and focusing on the People part of the framework, identifying key users, providers, challenges, and potential options for solutions.

Time	Session title	Lead
08:30 – 09:00	Coffee and networking	
09:00 – 09:30	Welcome, Introductions, the purpose of the workshop	TCIG + JNCC (Tara Pelembe)
09:30 – 09:45	Summary of TCI workshop	Roddy/Luc
09:45 - 10:15	Summary from meeting in Gibraltar and Case study 1: brief overview of how Gibraltar uses GIS in environmental management.	Stephen Warr
10:15 – 10:30	Break	
10:30 – 10:50	A framework for a biodiversity data/GIS strategy: People, data and systems	Steve Wilkinson.
10:50 – 11:30	People and data – What people either input into or use your data and why?	Tara Pelembe
11:30 – 11:50	Case study: Using maps to communicate to officials and the public in Anguilla for the Anguilla National Ecosystem Assessment.	Calvin Samuel + Katie Medcalf.
11:50 – 12:30	Challenges – what are the main people challenges you face relating to data and data use.	Tara Pelembe
12:30 – 13:30	Lunch	
13:30 – 13:50	Case Study: The opportunities and challenges around data access and data sharing and data use. <ul style="list-style-type: none"> • What systems are in place? • What works? • What are the main challenges? • Any other points to highlight. 	Rozina Norris-Gumbs
13:50 – 14:10	Case study: Example of bringing together people from a large number of organisations to share data.	Steve Wilkinson
14:10 – 14:30	Case study: Potential solutions to the ‘people challenge’ – the South Atlantic Overseas Territory example.	Illaria Marengo
14:30 – 15:00	Afternoon clinic – addressing the key challenges /training	ALL
15:00 – 15:15	Break	
15:15 – 16:00	Afternoon clinic – addressing the key challenges /training	
16:00 – 16:30	Key messages	ALL

Thursday 5th February – Data

People	Data	Systems
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Looking at the data part of the framework, learning from each other by considering what data we need and why, and exploring options for solutions to key challenges.

Time	Session title	Lead
08:30 – 09:00	Coffee and networking	
09:00 – 09:30	Welcome, and purpose of the day.	TCIG + JNCC (Tara Pelembe)
09:30 – 09:45	Why do we need data? What are the main drivers for you requiring data?	ALL
09:45- 10:15	Case study: What data you collect, what data is used, and what data you need.	Jeremy Olynik
10:15 – 10:30	Break	
10:30 – 11:00	What biodiversity and spatial data do we have?	ALL
11:00 – 11:20	Case study : <ul style="list-style-type: none"> • Example of data sets from your OT, outlining what you use them for, • Example of an innovative/new use/technique. • How data has added value to policies • Anything else you would like to highlight about GIS/data management on your OT that works well/that is a challenge. 	Mandy Shailer
11:20 – 11:40	What biodiversity and spatial data do we need?	ALL
11:40 – 12:00	What are the data gaps and how do we prioritise and address them?	ALL
12:00-12:30	Example of data collated by a UK organisation: OT Bathymetry	Alan Evans
12:30 – 13:30	Lunch	
13:30 – 14:00	What are the main challenges you face?	ALL
14:00 – 14:20	Tools for managing data: Metadata catalogue	iLaria Marengo.
14:20 – 14:40	GIS - Demonstration: what GIS can do to address policy/planning questions	Katie Medcalf
14:40 – 15:00	Afternoon clinic: addressing the key challenges /training	ALL
15:00 – 15:15	Break	
15:15 – 16:00	Afternoon clinic: addressing the key challenges /training	ALL
16:00 – 16:30	Key messages.	Tara Pelembe

Friday 6th February: Systems and the strategy and action plan.

People	Data	Systems
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Looking at the systems part of the framework, learning from each other by considering best practice and finalising our outputs i.e. the Data/GIS strategy and action plan.

Time	Session title	Lead
08:30 – 08:35	Welcome and the purpose of the day	TCIG and JNCC
8:35-9:05	Case study: Our data management system, overview, strengths and challenges.	Rondell Meade
9:05-10:00	An overview of existing systems and how to make best use of them – including International species sources (e.g. GBIF)	Steve Wilkinson
10:00 – 10:15	Break	
10:15 – 10:45	SAERI – systems and issues in the south Atlantic (best practice)	iLaria Marengo
10:45-11:15	QGIS – a tool for bringing together data to feed into planning and decision-making.	Katie Medcalf,
11:15 – 12:30	QGIS – tricks of the trade: an example of drop of points for fisheries in the ocean around the Caribbean.	Katie Medcalf.
12:30 – 13:30	Lunch	
13:30 – 14:00	Data management/GIS strategy – the principles.	ALL (Tara Pelembe)
14:00 – 15:30	Action planning	ALL (Tara Pelembe)
15:30 – 16:00	Conclusions and closing remarks	

Saturday 7th February – Field Trip

Annex 8: Workshop 2 ‘raw’ list of key messages

Red group

Embarrass people if they don't share.

Pictures and maps of sea changes.

Development policy is often not data-driven. If that is changed, it will be a big opportunity. Data is often regarded by decision-makers as opinion or subjective information – agenda-driven.

Small territories with strong IT sectors could manage nearly all government issues transparently and efficiently.

Progress in small territories depends on individuals with capacity and drive being in key positions.

Green Group

Validate, validate, validate

1. Policy – it is essential to have a policy.
 - a. Establish a local standard on par with international e.g. inspire.
2. People: the right people in the right place.
3. Common understanding of all agencies involved – everybody working together.

Communication – personalities are important.

Incorporation and importance of IT in any GIS working group.

Purple Group

1. Working as a team and set a Common goal (vision).
2. Engaging people from the beginning.
3. Data policy – sharing, license agreements, accessibility.

The role of data providers and users

IT support.

Potential application of GIS in various sectors.

Keep the system simple and understandable to most.

Invest in training/resources/technology.

Networking.

Annex 9: OT GIS data sets – what we have already and what we need

TCI Data sets – (spreadsheet document [available on the report webpage](#))

British Virgin Islands- Conservation and Fisheries Department Data sets – contributed by Rozina Norris-Gumbs.

Biodiversity Datasets of the Conservation and Fisheries Department

- Coastal Resources (Coral Reef, Mangrove, Seagrass)
- Mangrove Replanting Sites
- Beaches
- Ponds and Lagoons
- Environmental Sensitivity Areas
- Water Quality Sites
- Nesting Sites (Sea Turtles)

Some other Spatial Datasets of other departments

- Nesting Sites (Birds)
- Marine Protected Areas
- Vegetation
- National Parks/Bird Sanctuaries
- Coastline
- Cadastral Boundaries
- Buildings
- Geology
- Elevation Contours
- Soils
- Rivers /Streams/Watercourses
- Roads – Major and Minor
- Hazard-related Data (Flood, Landslide, Earthquake)
- Hurricane tracks

Bermuda GIS Datasets – Department of Conservation Services - contributed by Mandy Shailer.

Terrestrial

- Aerial Photos
 - 1941, 1962, 1973, 1981, 1997, 2003, 2010 (satellite only), 2012
- Topographic Map Database 2003 (2012 update coming soon)
 - Buildings
 - Coastline
 - Contours
 - Cultivation
 - Natural Vegetation

- Open Land
 - Roads
 - Rock
 - Sand
 - Swimming Pools
 - Water Features
- Digital Elevation Model (terrestrial)
- Addresses
- Planning Zones
 - Conservation Zones
 - Development Zones
- National Parks
- Nature Reserves
- Terrestrial Habitats
- Environmental Sensitivity Ranking of the coastline
- Longtails
- Caves
- Ramsar Sites

Marine

- 1997 Aerial Photos (extends out to edge of reef platform)
- Marine Boundaries
 - Baseline (from which the Territorial Sea and EEZ are measured)
 - Territorial Sea
 - Exclusive Economic Zone
- Bays, Harbours and Sounds
- Electronic Chart datasets (provided by the UKHO)
- Ship Channels
- Bathymetry
 - Bathymetric Contour Lines
 - Digital Elevation Model (bathymetric)
- Marine Protected Areas
 - Coral Reef Preserves
 - Dive Site Protected Areas
 - No Lobster Fishing Area
 - No Net Fishing
 - Seasonally Protected Areas
 - Spearfishing Exclusion Zone
- Benthic Habitat Mapping
 - Seagrass
 - Corals
 - Sponges
 - Algae
 - Water Quality
 - Nutrients
- Shipwrecks
- Reefs
- Mangroves
- Important Bird Area
- Bermuda Turtle Project
- Cahow (nest locations and off-shore tracking data)

Annex 10: Additional information and reference material

Inspire framework

- inspire directive

Gibraltar geoportal

www.geoportal.gov.gi

St Helena Case study:

Land use planning:

- The legislative frameworks is provided by the Land Planning and development control ordinance [here>>](#)
- This implemented through the St Helena land development control plan [here>>](#) with accompanying map [here>>](#) and supporting appendices [here >>](#)
- Includes National Protected Areas (called National Conservation areas there)
- Guidelines/manual for EIA manual [here >>](#) (this is old and needs to be updated to reflect the updated legislation.)

Sustainable development framework

The Sustainable development plan [here>>](#) is the overarching plan for the development of the island. Within this there are 3 National Goals that address the 3 pillars of sustainable development: Economic, social and environmental.

The detailed implementation of these goals are provided through three subsidiary plans that focus on each goal:

- Sustainable economic development plan [here>>](#)
- National Environmental management plan (NEMP) [here >>](#)
- Social development plan [here>>](#)

There are also a suite of subsidiary environmental policies (the focus for these was around addressing the main perceived current and future threats) – as outlined in the NEMP include things like whale-shark watching, sand extraction, [endemic plant propagation](#) and distribution, [waste management](#), research permitting.

Additional processes to mainstream environment

- EIA addressed through the planning process.
- Strategic environmental assessments – addressed through the policy development process (environmental review of all policies required).
- Political decision-making – All high level decision-papers that go to government political bodies (Legco and Exco) have an environmental impact section which is either written/reviewed by the Environmental Management Department.

Reporting

- Annual [state of the environment report](#)

Cayman Islands

- Link to recently passed National Conservation Law There is also a link to a National Biodiversity Action Plan on the right side of this page.
- <http://www.doe.ky/laws/national-conservation-law/>

(Additional documentation is [available on the report webpage](#))

Annex 11: Visions and strategies

Anguilla

Provides a value to issues: e.g. cost of action or inaction

Illustrates the not so obvious e.g. showing perceptions

TCI, DEMA and DDME

Allows the appropriate plans/policies/legislation to be developed/implemented/enforced

If we have mapped evidence of threat sources, we can begin to take the necessary actions to protect resource and mitigate losses to life, property, environment

Allows mapping of key site value

Aids sustainable spatial planning and development goals

Threats: uncontrolled development; illegal immigration; lack of political will; no updated physical development plan

How to fulfil our vision:

Conduct physical survey – ground truthing

Make (amend) policies, laws to address the problem

Use GIS modeling scenario mapping

Prepare (prioritise) the updating of the physical development plan

Revised the environment charter (political commitment)

Police

Crime prevention

Data share multi department

Lack of crown land

Damage to fisheries.

Policy makers will be well-informed and make objective decisions based on evidence.

Cayman

Learn from mistakes

Anticipate hurdles

Desire vs practicality

Easier ways of accomplishing tasks

Contact with experience

Bermuda

Threats: Sea level rise; invasive species

Vision: improved data management

Comprehensive bathymetry

Better implementation of GIS development strategy

`Strategy for using data to influence policy and decision-making' (TCI)

Overall Vision: Sustainable Development.

Target data collection and analysis to address key policy decisions that are either being made or are seen as being required.

What are the big questions/issues that we need data for (in priority order)?

1. Sustainable land use
2. Watershed management
3. Biodiversity management
4. Sustainable fisheries
5. Waste management
6. Hazard mitigation and adaptation
7. Climate change
8. Protecting ruins and historic areas
9. To depict accident prone areas.

What data do we need to create a better evidence base to feed into/influence decisions around our main threats?

Sustainable land use:

- The issue/threat is that there is no land use management plan and we don't have much land, and we are losing our environmental assets. This is a problem for biodiversity management, environmental services, and economic loss.
- The government want development to happen and development is developer driven. There is no National vision or vision for what the 'tourism product' is.

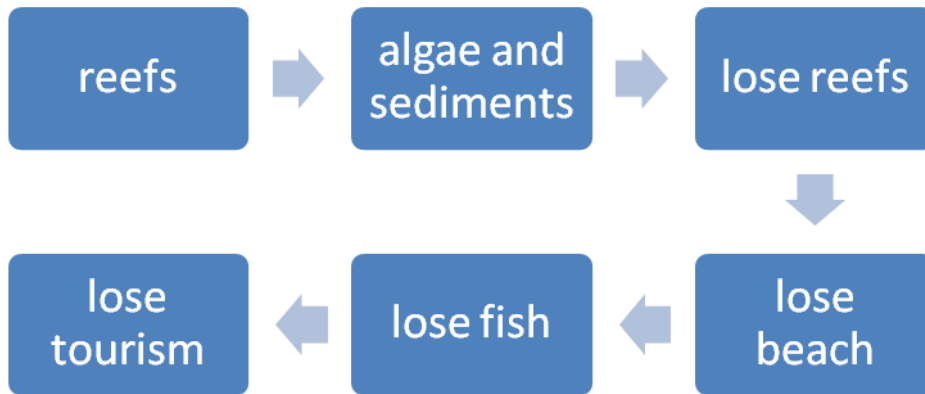
Decision being sought: We need a sustainable Land Use Plan

- Information/advice has been given that high density development is required to make development work.
- It would be good to model the costs and benefits of different development models (low density vs high density) to see which is best in the long term.
- Some scenarios that might be influential in the decision-making process are:
 - **Scenario 1:** The impact of filling in and building on the wetlands:
 - showing that ponds = drainage; no ponds = no drainage = floods.
 - Using the terrestrial habitat map and recent flooding.
 - **Scenario 2:** The impact of a storm surge
 - showing building that within the 100ft set back line
 - flooding occurring if there is a storm surge.
 - Showing why spatial planning needed to reduce risk.
 - **Scenario 3:** The impact of overcrowding on beaches:
 - Showing how the biggest asset to Tourism (the beach) is going to be devalued if not planned properly – the chair war

- Space for number of beach chairs on the beach – matched to the number of rooms in the hotels that have access to/use that beach.

Watershed management:

- Scenario that might be influential in the decision-making process is:



How do we use the data to influence/create policy?

Action??: Table a cabinet paper proposing a sustainable land use plan that includes the scenarios identified above??

How, Who (cross departmental approach??), by when.