

Cuba research questions

The following research questions and accompanying reading lists are provided to give everyone a chance to think about the scientific work and research areas that they might encounter in Cuba. The list is a starting point for those doing CoPE and other extended project work and you may wish to alter the question or go in a slightly different direction but do consult your tutor/Opwall before deciding in your final topic: make sure it is practical and you are really interested in it.

The reading lists are only 'starters' and NOT meant to be a definitive list for your research. You will get many leads from these and we have chosen a good range of sources from academic papers to video clips. We have checked all of the internet links but these constantly change with time so expect some not to work (cut and paste into your web browser address bar if you have an electronic version of this booklet). We have tried to direct you to the summary abstracts of many of the papers cited as they are not easily available unless you have access to a University library or a journal 'on-line'. Many of these references and others will be taken into the field on a USB pen and available to read on site.

Background reading

Books

Sainsbury B (2009) Cuba. Lonely Planet Guides

Kaplan EA (1990) Field Guide to the Coral Reefs of the Caribbean and Florida. Peterson Field Guides

Silva Lee A (1997) Natural Cuba. Pangaea

Colin PL (1998) Marine Invertebrates and Plants of the Living Reef. TFH Publications Inc

Research questions	List
How will climate change affect coral reefs?	<p>Article - Thomas, C Extinction risk from climate change - Nature 2004 Vol 427, 8 January 2004. http://eprints.whiterose.ac.uk/83/1/thomascd1.pdf</p> <p>Academic paper - Hoegh-Guldberg, O Climate change, coral bleaching and the future of the world's coral reefs. Marine Freshwater Res Vol 50 http://www.reef.edu.au/climate/Hoegh-Guldberg%201999.pdf</p> <p>Article - Coral Reef Resilience to Climate Change - IUCN website - http://www.iucn.org/cccr/resilience_to_climate_change/</p> <p>Academic paper - report - Buuemeier, R Coral reefs and Global Climate Change (2004) Pew Center - Global Climate Change - http://www.pewclimate.org/docUploads/Coral_Reefs.pdf</p> <p>Article – ESA Ecological Society of America – Coral Reefs http://www.esa.org/education_diversity/pdfDocs/coralreefs.pdf</p>
How are coral and reef fish communities	<p>Academic papers - OpWall research library - email Opwall to request the</p>

<p>assessed?</p>	<p>following lists - IH257 Comparison between methods to assess coral reef habitat quality: physical and biological properties IH258 Comparison between methods to assess coral reef fish community structure and the production of standardized protocols Academic paper - Beenaerts, N Comparative Study of Three Transect methods to Assess Coral Cover, Richness and Diversity. Western Indian Ocean J. mar. Sci. Vol 4 No 1 pp 29-37 (2005) http://ajol.info/index.php/wiojms/article/viewFile/28471/5151 (cut and paste and use quick view) Academic paper - Cabaitan, P Comparison Between Videographic and Photographic Methods in Assessing Coral Reef Benthic Communities - Science Diliman - 19:1 7-13 2006 (can download – cut paste title then load from journals.upd.edu) Other - academic reading list for Coral reef-methodology - http://www.mendeley.com/research-papers/tag/coral+reef-methodology/</p>
<p>What are the main types of coral and in what growth forms can they exist?</p>	<p>Academic paper - Chappell, J Coral morphology, diversity and reef growth - Nature (1980) Vol 286, Pages 249-252 http://www.nature.com/nature/journal/v286/n5770/abs/286249a0.html (you will need to find someone at University with a subscription or pay \$18) Other - definition Coral reef - http://en.wikipedia.org/wiki/Coral_reef#Coral_biology Book - Spalding M, M World Atlas of Coral Reefs - paste title into google and find books. google.co.uk/books? etc. You will then have most of the book!</p>
<p>What is a symbiotic relationship and what examples can be found within the reef?</p>	<p>Academic paper - Kinzie R Sex, symbiosis and coral reef communities American Zoologist (1999) Volume: 39, Issue: 1, Pages: 80-91 http://icb.oxfordjournals.org/content/39/1/80.full.pdf+html Book - Smith DC The Biology of Symbiosis Edward Arnold 1973 (Amazon sell the paperback version for \$3.00) Article - Georgill, C An Overview of coral reef symbiosis - Helium website - http://www.helium.com/items/1474677-symbiosis-in-coral-reef-communities</p>
<p>Why are coral reefs so important and what are the threats to its survival?</p>	<p>Article – ESA Ecological Society of America – Coral Reefs http://www.esa.org/education_diversity/pdfDocs/coralreefs.pdf Other – Typing in the title into google yields many useful references. Academic paper - Valdes J – Effects of tourism activities on coral reef communities in the Punta Frances national Marine Park, Cuba Rev.Invest Mar. 28(2): 159-176, 2007 http://www.cim.uh.cu/rim/pdf/2007/2/2007-159.pdf</p>
<p>What is the importance and function of</p>	<p>Academic papers - Go to http://www.mendeley.com/research-papers/ in the search box type 'importance of mangroves ' - you now have a mass of</p>

<p>Mangrove forests on Marine Ecosystems?</p>	<p>academic papers. Follow the links or cut and paste title into google. e.g. Life at the margins : The social , economic and ecological importance of mangroves takes you to http://www1.inacol.edu.mx/myb/resumeness/no.%20esp.1/pdf/Acharya%202002.PDF Article - WWF website - Linking the land to the sea - http://wwf.panda.org/about_our_earth/blue_planet/coasts/mangroves/ Academic paper - Kannan, L. (1990). Mangroves – their importance and need for conservation. <i>Biology Education</i>, 7, 93-103. http://old.iupac.org/symposia/proceedings/phuket97/miles.pdf</p>
<p>What survey methods can be used for assessing coral reef systems?</p>	<p>Academic papers - OpWall research library - email Opwall to request the following lists - IH257 Comparison between methods to assess coral reef habitat quality: physical and biological properties IH258 Comparison between methods to assess coral reef fish community structure and the production of standardized protocols Academic paper - Beenaerts, N Compartaive Study of Three Transect methods to Assess Coarl Cover, Richness and Diversity. <i>Western Indian Ocean J. mar. Sci.</i> Vol 4 No 1 pp 29-37 (2005) http://ajol.info/index.php/wiojms/article/viewFile/28471/5151 Academic paper -Cabaitan, P Comparison Between Videographic and Photographic Methods in Assessing Coral Reef Benthic Communities - <i>Science Diliman</i> - 19:1 7-13 2006 journals.upd.edu.ph/index.php/sciencediliman/article/download/94/218 Other - academic reading list for Coral reef-methodology - http://www.mendeley.com/research-papers/tag/coral+reef-methodology/</p>
<p>Discuss the importance of Manatee monitoring in Cuba; include details of the monitoring program and the techniques used on site.</p>	<p>Website – Manatees - http://www.manatees.net/ Article – Coastal Conservation in Cuba EcoHealth Alliance http://www.ecohealthalliance.org/wildlife/17-coastal_conservation_in_cuba Report – USGS Conserving Manatees beyond borders - http://fl.biology.usgs.gov/Science_Feature_Archive/2010/manatees_in_cuba/bonde_in_cuba.html Book - (2006). Swinburne S Saving manatees. Boyds Mills Press. ISBN: 9781590783191 (\$7 http://www.valorebooks.com/Search/ISBN/9781590783191</p>
<p>Discuss the importance of Turtle monitoring in Cuba; include details of the monitoring program and the techniques used on site.</p>	<p>Report - MEETING REPORT Third International Centro de Investigaciones Marinas Workshop on Sea Turtle Conservation in Cuba. Sigüanea Bay, Isla de la Juventud, Cuba, April 22-30, 2009 <i>Marine Turtle Newsletter</i> 127;27-28 2010 http://www.seaturtle.org/mtn/archives/mtn127/mtn127p27.shtml Website – Euroturtle website – background about marine turtles – http://www.euroturtle.org Book – Spotila J – Sea Turtles: a complete guide to their biology, behavior and</p>

	conservation – type in to google spotila sea turtles – go to books.google.co.uk
What are the main reef fish families and how do scientists study them?	<p>Other – Coral Reef fish http://en.wikipedia.org/wiki/Coral_reef_fish Masses of references at the end of the article.</p> <p>Website – Coral-Reef-Info. http://www.coral-reef-info.com/coral-reef-fishes.html</p>
Why is sea grass so important and what are the main threats to its survival?	<p>Other – Seagrass – http://en.wikipedia.org/wiki/Seagrass</p> <p>Academic paper /article - Importance of Seagrass Fish and Wildlife Research Institute – http://research.myfwc.com/features/view_article.asp?id=20720</p> <p>Academic paper - Jackson, E. L., Rowden, A. A., Attrill, M. J., Bossey, S. J., & Jones, M. B. (2001). The importance of seagrass beds as a habitat for fishery species. <i>Oceanography And Marine Biology An Annual Review</i>, 39, 269-303. http://thesisabstracts.com/ThesisAbstract_57_Importance-of-seagrass-beds-as-a-habitat-for-fishery-species-around-Jersey-English-Channel.html</p> <p>Academic paper – Duffy, J. E. (2006). Biodiversity and the functioning of seagrass ecosystems. <i>Marine Ecology Progress Series</i>, 311, 233-250. http://www.int-res.com/articles/meps_oa/m311p233.pdf</p>
What are the main Marine Protected Areas in Cuba and how are they managed?	<p>Report – 2004 Estrada, The National System of Marine Protected Areas in Cuba – CNAP - http://www.edf.org/documents/3692_mpasCubaIngles.pdf</p> <p>Article – Biodiversity and Protected areas – Cuba Earth Trends Country Profile - http://earthtrends.wri.org/pdf_library/country_profiles/bio_cou_192.pdf</p>
What is the importance of the Punta Frances National Park and how is it managed?	<p>Report – 2004 Estrada, The National Sytem of Marine Protected Areas in Cuba – CNAP - http://www.edf.org/documents/3692_mpasCubaIngles.pdf</p> <p>Article – Biodiversity and Protected areas – Cuba Earth Trends Country Profile - http://earthtrends.wri.org/pdf_library/country_profiles/bio_cou_192.pdf</p>
How successful is ‘head-starting’ in increasing the populations of marine turtles?	<p>Report - MEETING REPORT Third International Centro de Investigaciones Marinas Workshop on Sea Turtle Conservation in Cuba. Sigüanea Bay, Isla de la Juventud, Cuba, April 22-30, 2009 Marine Turtle Newsletter 127;27-28 2010 http://www.seaturtle.org/mtn/archives/mtn127/mtn127p27.shtml</p> <p>Website – Euroturtle website – background about marine turtles – http://www.euroturtle.org</p> <p>Book – Spotila J – Sea Turtles: a complete guide to their biology, behavior and conservation – type in to google head starting in turtles – go to books.google.co.uk</p>