

# References and Glossary of Terms



Photograph Courtesy of Sandy Hillis-Starr

Elkhorn Coral

Buck Island Reef National Monument  
Draft General Management Plan/  
Environmental Impact Statement

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## REFERENCES

Acevedo-Rodriguez, Pedro

- 1996 *Flora of St. John, U. S. Virgin Islands*. Memoirs of the New York Botanical Gardens, Volume 78. the New York Botanical Garden, Bronx, New York.

Acropora Biological Review Team

- 2005 Atlantic Acropora Status Review Document. Report to National Marine Fisheries Service, Southeast Regional Office. March 3, 2005. 152 p + App.

Anderson, M., H. Lund, E.H. Gladfelter, and M. Davies.

- 1986 Ecological community type maps and biological community descriptions for Buck Island Reef National Monument and proposed marine park sites in the British Virgin Islands. U.S. National Park Service and Virgin Islands Resource Management Cooperative Rep., 236p. In Bythell, J.C., Gladfelter, E.H., Gladfelter, W.B., French, K.E., and Hillis, Z. 1989. Buck Island Reef National Monument – changes in modern reef-community structure since 1976. In Hubbard, D.K., (ed.) No date. Terrestrial and Marine Geology of St. Croix, U.S. Virgin Islands: West Indies Laboratory, Special Publication, No. 8, p. 145-154.

Aronson, Richard B and William F. Precht

- 2006 Conservation, precaution, and Caribbean reefs. 1 June 2006. Coral Reefs 25: 441-450. DOI 10.1007/s00338-006-0122-9.

Barange, M.

- 2002 Influence of Climate Variability and Climate Change on the Structure, Dynamics and Exploitation of Marine Ecosystems. Issues in Environmental Science and Technology, No. 17. Global Environmental Change. Royal Society of Chemistry.

Barros, F.

- 2001 Ghost crabs as a tool for rapid assessment of human impacts on exposed sandy beaches. Biological Conservation, Vol. 97, pp. 399-404

Bayer, F.M, and C.R. Robins.

- 1965 Report to the National Park Service on the Buck Island Coral Reef National Monument. Unpublished.

Boyer, William W.

- 1983 America's Virgin Islands: A History of Human Rights and Wrongs. Carolina Academic Press, Durham, NC.

Bythell, John C., Elizabeth H. Gladfelter, William B. Gladfelter, Kathleen E. French, and Zany Hillis.

- 1989 Buck Island Reef National Monument—Changes in Modern Reef Community Structure Since 1976. In Terrestrial and Marine Geology of St. Croix, U.S. Virgin Islands, edited by Dennis K. Hubbard. Special Publication Number 8, West Indies Laboratory, St. Croix

Bythell, J.C., E.H. Gladfelter, and M. Bythell.

- 1992 Ecological studies of Buck Island Reef National Monument, St. Croix, US Virgin Islands. A quantitative assessment of selected components of the coral reef ecosystem and establishment of long-term monitoring sites. Part II. US National Park Service, Cruz Bay, St. John, US Virgin Islands. 72 pp. In Waddell, J.E. (ed.). 2005. The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005. NOAA Technical Memorandum NOS NCCOS 11. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 522 pp.

Bythell J.C., Bythell M., Gladfelter E.H.

- 1993a Initial results of a long-term coral-reef monitoring program - impact of hurricane Hugo at Buck Island Reef National Monument, St Croix, U.S. Virgin Islands. *J. Exp. Mar. Biol. Ecol.* 172: 171-183.

Bythell J.C., Hillis-Starr Z.M., Philips B., Burnett W.J., Larcombe J., Bythell M.

- 2000a Buck Island Reef National Monument, St Croix, US Virgin Islands: Assessment of the impacts of Hurricane Lenny (1999) and status of the reef 2000. National Park Service Report, 38 pp.

Bythell, J.C., Hillis-Starr, Z. and Rogers, C.S.

- 2000b Local variability but landscape stability in coral reef communities following repeated hurricane impacts. *Marine Ecology Progress Series* 204: 93-100. In Rogers, C.S. and Beets, J. 2001. Degradation of marine ecosystems and decline of fishery resources in marine protected areas in the U.S. Virgin Islands. *Environmental Conservation* 28 (4): 312-322.

Caribbean Fisheries Management Council

- 1998 Essential Fish Habitat (EFH) Generic Amendment to the Fishery Management Plans (FMPs) of the U.S. Caribbean including a draft Environmental Assessment. Volumes I and II. Caribbean Fishery Management Council. In Caribbean Fisheries Management Council. 2004 Final Environmental Impact Statement for the Generic Essential Fish Habitat Amendment to: Spiny Lobster Fishery Management Plan, Queen Conch Fishery Management Plan, Reef Fish Fishery Management Plan, Coral Fishery Management Plan for the U.S. Caribbean Volume 1: Text. March 2004. Internet web page: <http://www.caribbeanfmc.com/EFH-EIS%20FMP.htm>
- 2004 Final Environmental Impact Statement for the Generic Essential Fish Habitat Amendment to: Spiny Lobster Fishery Management Plan, Queen Conch Fishery Management Plan, Reef Fish Fishery Management Plan, Coral Fishery Management Plan for the U.S. Caribbean Volume 1: Text. March 2004. Available on the internet at <http://www.caribbeanfmc.com/EFH-EIS%20FMP.htm>

Caron, Aimery P.

- 1982 Inventory of French Documents Pertaining to the U.S. Virgin Islands (1629-1737). 2<sup>nd</sup> Edition. 1982.

Caron, Aimery P., and Arnold R. Highfield

- 1980 The Unsuccessful Colonists: The French on St. Croix in the Seventeenth Century. The Daily News: 50th Anniversary Edition, 1 August 1980. St. Thomas, USVI.

Cooper, R.J., S.B. Cederbraum, and J.J. Gannon

- 2005 Natural Resource Summary for Padre Island National Seashore Final Report. February 2005. Athens, GA: Warnell School of Forest Resources, University of Georgia.

Cornell Lab of Ornithology

- 2003 "All About Birds: Least Tern." Available on the internet at [http://www.birds.cornell.edu/AllAboutBirds/BirdGuide/Least\\_Tern.html](http://www.birds.cornell.edu/AllAboutBirds/BirdGuide/Least_Tern.html)

Cox, Carrollyn, Adrianna Zito, Rodney Bertelsen and John H. Hunt

- 2009 Buck Island Reef National Monument Lobster Population Study Final Summary Report. Submitted to Buck Island Reef National Monument, National Park Service by Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, South Florida Regional Laboratory. Marathon FL. April 28, 2009.

Danovaro R., L. Bongiorno, C. Corinaldesi, D. Giovannelli, E. Damiani, P. Astolfi, L. Greci, and A. Pusceddu.

- 2008 Sunscreens Cause Coral Bleaching by Promoting Viral Infections. Environmental Health Perspectives Volume 116, Number 4. April 2008. Available on the internet at <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2291018>

Department of Planning and Natural Resources, U.S. Virgin Islands

- 2005a STXEEMP Zoning: Map of park management areas as represented in the draft rules and regulations. Available on the Internet at <http://www.stxeastendmarinepark.org/maps.htm>
- 2005b U.S Virgin Islands, Department of Planning and Natural Resources. 2005. Comprehensive Wildlife Conservation Strategy for the U.S. Virgin Islands, Division of Fish and Wildlife, Bureau of Wildlife.
- 2006a The 2006 Integrated Water Quality Monitoring and Assessment Report for the United States Virgin Islands, September 21, 2006. Division of Environmental Protection, Department of Planning and Natural Resources, Government of the Virgin Islands of the United States.
- 2006c Non-Point Source Program. United States Virgin Islands Division of Environmental Protection. Revised May 23, 2006. Accessed December 1, 2006. Available on the internet at <http://dpnr.gov.vi/dep/Non-PointSource.htm>
- 2008 14-Dec-2008: Notice of Intent to Establish Revised Water Quality Standards. Accessed May 22, 2009. Available on the internet at [http://dpnr.gov.vi/dep/water\\_notice\\_I4\\_dec\\_08.htm](http://dpnr.gov.vi/dep/water_notice_I4_dec_08.htm)

Dodd, Kenneth C.

- 1992 Loggerhead sea turtle *Caretta caretta*. In Rare and Endangered Biota of Florida, Vol. III. Amphibians and Reptiles. Paul E. Moler, ed. Ray E. Ashton, series ed. University Press of Florida. Gainesville, FL.

Drayton, N., C. Rogers, and B. Devine

- 2004 The state of the coral reefs of the U.S. Virgin Islands. The Ocean Conservancy. Available at <http://www.oceanconservancy.org/site/PageServer?pagename=stateofthereefs>

Edmunds, P.J. and J.D. Witman

- 1991 Effect of Hurricane Hugo on the primary frame-work of a reef along the south shore of St. John, USVI. *Mar. Ecol. Prog. Ser.* 78:201-204. In U.S. Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife. 2005. United States Virgin Islands Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan. December 2005.

Faber Morse, Brigit

- 1995 The Sequence of Occupations at the Salt River Site, St. Croix. *Proceedings of the International Congress for Caribbean Archaeology* 15:471-484. San Juan, Puerto Rico. 1995.

Figueredo, Alfredo E.

- 1978a The Virgin Islands as an Historical Frontier Between the Tainos and the Caribs. *Revista/Review Interamericana* VIII(3).
- 1978b The Early European Colonization of St. Croix (1621-1642). *Journal of the Virgin Islands Archaeological Society* 6.

Gibney, Eleanor

- 1996 *Vegetation of the Buck Island Reef National Monument; an Initial Reassessment*. Prepared for the National Biological Service and the Friends of the Virgin Islands National Park. St. John, US Virgin Islands.

Gladfelter, W.B.

- 1982 White-band disease in *Acropora palmata*: implications for the structure and growth of shallow reefs. *Bulletin of Marine Science* 32: 639-643. In Rogers, C.S. and Beets, J. (2001) Degradation of marine ecosystems and decline of fishery resources in marine protected areas in the US Virgin Islands. *Environmental Conservation* 28 (4): 312-322.

Gladfelter, W.B., Gladfelter, E.H. Monahan, R.K., Ogden, J.C. and Dill, R.F.

- 1977 Environmental studies of Buck Island Reef National Monument, St. Croix, USVI. Report to the US National Park Service, Crux Bay, St. John, USA. In Rogers, C.S. and Beets, J. (2001) Degradation of marine ecosystems and decline of fishery resources in marine protected areas in the US Virgin Islands. *Environmental Conservation* 28 (4): 312-322.

Gladfelter, Elizabeth H and John C. Bythell

- 1991 Ecological Studies of Buck Island Reef National Monument, St. Croix, U.S. Virgin Islands: A Quantitative Assessment of Selected Components of the Coral Reef Ecosystem and Establishment of Long Term Monitoring Sites. Prepared for the National Park Service, U.S. Department of the Interior, June 1991.

Green, James Warren

- 1972 Social Networks in St. Croix, U.S. Virgin Islands. Ph.D dissertation, University of Washington.

Hansen, J. M. Sato, R. Ruedy, K. Lo., D. W. Lea, and M. Medina-Elizade

- 2006 Global Temperature Change. *Proceedings of the National Academy of Sciences of the United States of America*. 2006. Published On-Line, September 26, 2006, vol. 103, no. 39. pp 14288-14293

Hardy, Meredith D.

- 2002 Trip Report, Describing Activities Performed While Conducting Archival Research and Initial Archeological Pedestrian Survey of Buck Island Reef National Monument (BUIS), St. Croix, U.S. Virgin Islands, July 16-26, 2002. SEAC ACC. 1780. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee, FL.
- 2003 Archaeological Overview and Assessment document for Buck Island Reef National Monument. National Park Service, Southeast Archaeological Center, Tallahassee, FL.
- 2004 *Draft Archeological Overview and Assessment of Christiansted National Historic Site, St. Croix, United States Virgin Islands*. Tallahassee, FL: NPS Southeast Archeological Center.
- 2006 Buck Island Reef National Monument, Archeological Overview and Assessment. Southeast Archeological Center, National Park Service, Tallahassee, Florida.
- Hayward, Michele Helene, Michael A. Cinquino, Frank J. Schieppati, Camille Stanley, Yvonne Narganes Storde, and Lee Ann Newsom
- 1997 Archaeological Investigations at the Aklis Site Sandy Point National Wildlife Refuge St. Croix, U.S. Virgin Islands. Panamerican Consultants, Inc., Depew, NY. Prepared for National Park Service, Tallahassee, FL.
- Hubbard, D.K., T. H. Suchanek, I. P. Gill, S. Cowper, J. C. Ogden, J. R. Westerfield and J. Bayes
- 1981 Preliminary Studies of the Fate of Shallow-Water Detritus in the Basin North of St. Croix, U.S.V.I. Proceedings of the Fourth International Coral Reef Symposium, Manila, 1981, Vol. 1.
- Hubbard, D.K., H. Zankl, I. Van Heerden and I. P. Gill
- 2005 Holocene Reef Development Along the Northeastern St. Croix Shelf, Buck Island, U.S. Virgin islands. *Journal of Sedimentary Research*, January 2005. Volume 75(1).
- Inter-American Convention for the Conservation and Protection of Sea Turtles (IAC), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention for the Protection and Development of the Marine Environment of the Wider Caribbean region (Cartagena Convention) and Protocol Concerning Specially Protected Areas and Wildlife (SPA), Mexico's Consejo Nacional de Áreas Protegidas (CONANP), Mexico's Secretaria de Medio Ambiente y Recursos Naturales (SEMARNAT) and World Wildlife Fund (WWF)
- 2009 Report of the Regional Workshop for the Hawksbill turtle in the Wider Caribbean and Western Atlantic" Puerto Morelos, Quintana Ro, Mexico. September 23rd-25th 2009. IAC, CITES, SPAW, CONANP, SEMARNAT, WWF.
- Ingle, C., H. Bauman, Y. Leung, and C. Monz
- 2003 Monitoring visitor impacts in coastal national parks: A Review of techniques in protecting our diverse heritage, In *The Role of Parks, Protected Areas, and Cultural Sites*, edited by D. Harmon, B.M. Kilgore, and G.E. Vietzke. Accessed on the Internet at <http://www.georgewright.org/0350ingle.pdf>.
- Intergovernmental Panel on Climate Change
- 2007 *Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability, Summary for Policy Makers; The Physical Science Basis, Summary for Policy Makers*. Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. IPCC WGII Fourth Assessment Report. April 6, 2007.

Integrated Taxonomic Information System

- 2006 Integrated Taxonomic Information System. Available on the internet at <http://www.itis.gov/>

Johnston, Barbara

- 1982 Virgin Islands Inventory of Historic Places, Site 12Vam1-68, Forms 1 and 3. Department of Planning and Natural Resources, Division for Archaeology and Historic Preservation, Charlotte Amalie, St. Thomas, USVI.

Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson (eds.)

- 2009 Global Climate Change Impacts in the United States. Cambridge University Press

Kendall, M.S., JD Christensen, and Z Hillis-Starr,

- 2003 Multi-scale data used to analyze the spatial distribution of French gurnts, *Haemulon flavolineatum*, relative to hard and soft bottom in a benthic landscape. *Environ. Biol. Fish.* 66: 19-26.

Kendall, M.S., M.E. Monaco, K.R. Buja1, J.D. Christensen, C.R. Kruer, and M. Finkbeiner, R.A. Warner1.

- 2001 Methods Used to Map the Benthic Habitats of Puerto Rico and the U.S. Virgin Islands. Available on the internet at <http://biogeo.nos.noaa.gov/projects/mapping/caribbean/startup.htm>.

Kendall, M.S., T. Battista, Z. Hillis-Starr.

- 2004 a Long term expansion of a deep *Syringodium filiforme* meadow in St. Croix, U.S. Virgin Islands: the potential role of hurricanes in the dispersal of seeds. *Aquatic Botany* 78: 15-25

Kendall, M.S., J.D Christensen, C. Caldow, M. Coyne, C. Jeffrey, W. Morrison, Z. Hillis-Starr

- 2004 b The influence of bottom type and shelf position on biodiversity of tropical fish inside a recently enlarged marine reserve. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 14: 113-132. Published on-line at [www.interscience.wiley.com](http://www.interscience.wiley.com). DOI:10.1002/aqc.601

Lazendorf, Brenda

- 2000 Trip Report Describing Activities Performed While Conducting a Reconnaissance Survey of a Submerged Cultural Site at Buck Island Reef National Monument, U.S. Virgin Islands, April 18 through April 22, 2000. SEAC ACC. 1506. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee, FL.

Lewisohn, Florence

- 1970 St. Croix under Seven Flags. Being a "Cruzan" Cavalcade of The Islands of St. Croix in the Virgens: A History of Many Sorts of Famous Men, Infamous Events, Pirates and Planters, West Indian Folk and Their Lore. Recounting Five Centuries of Lively Events on One Little Island. The Dukane Press, Hollywood, FL.

Lombard, C.

- 2007 Personal communication, Zandy Hillis Starr and C. Lombard regarding nesting terns in the St. Croix area.



Lundgren, Ian

- 2008 The Decline of Elkhorn Coral at Buck Island Reef National Monument: Protecting the First Threatened Coral Species. *Park Science*. Volume 25, Number 1. Summer 2008.
- 2009 Personal communication regarding non- native invasive plant control. April 2009.

Lundgren, Ian and Zandy Hillis-Starr

- 2008 Variation in *Acropora* palmate bleaching across benthic zones at Buck Island Reef National Monument (St. Croix, USVI) during the 2005 thermal stress event.
- 2009 Invasive Lionfish Emergency Implementation Plan, Buck Island Reef National Monument, 2009.

Mac, M.J., P.A. Opler, C.E. Puckett Haeker, and P.D. Doran.

- 1998 Status and trends of the nation's biological resources. Vol. 1 and 2. U.S. Department of the Interior, U.S. Geological Survey, Reston, Va. 1-964 pp. Section available on the internet at <http://biology.usgs.gov/s+t/SNT/noframe/cr136.htm>

MacDonald, L.H., D.M. Anderson and W.E. Dietrich

- 1997 "Paradise Threatened: Land Use and Erosion on St. John, U.S. Virgin Islands," *Environmental Management*, Vol. 21, No. 6, pp. 851-863.

Mayor, Philippe A., Caroline S. Rogers, and Zandy M. Hillis-Starr

- 2006 Distribution and abundance of elkhorn coral, *Acropora* palmate, and prevalence of white-band disease at Buck Island Reef National Monument, St. Croix, US Virgin Islands. *Coral Reefs* (2006) 25: 239-242, DOI 10.1007/s00338-006-0093-x.

Meehl, G.A., T.F. Stocker, W.D. Collins, P. Friedlingstein, A.T. Gaye, J.M. Gregory, A. Kitoh, R. Knutti, J.M. Murphy, A. Noda, S.C.B. Raper, I.G. Watterson, A.J. Weaver and Z.-C. Zhao

- 2007 Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Menza, C., J. Ault, J. Beets, J. Bohnsack, C. Caldwell, J. Christensen, A. Friedlander, C. Jeffrey, M. Kendall, J. Luo, M. Monaco, S. Smith and K. Woody.

- 2006 A Guide to Monitoring Reef Fish in the National Park Service's South Florida / Caribbean Network. NOAA Technical Memorandum NOS NCCOS 39. 166 pp.\

Miller, R.J.

- 2005 In preparation. White plague disease outbreak following the 2005 Caribbean coral bleaching event.

Miller, R.J., A.J. Adams, N.B. Ogden, J.C. Ogden, and J.P. Ebersole.

- 2005 *Diadema antillarum* 17 years after mass mortality: Is recovery beginning on St. Croix? *Coral Reefs* 22:181-187. In U.S. Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife. 2005. United States Virgin Islands Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan. December 2005.

Miller, J., E. Muller, C. Rogers, R. Waara, A. Atkinson, K.R. T. Whelan, M. Patterson, B. Witcher

- 2009 Coral disease following massive bleaching in 2005 causes 60% decline in coral cover on reefs in the US Virgin Islands. Coral Reefs. DOI 10.1007/s00338-009-0531-7. Available on the internet at [http://science.nature.nps.gov/im/units/sfcn/docs/Miller\\_J\\_CoralReefsPub2009.pdf](http://science.nature.nps.gov/im/units/sfcn/docs/Miller_J_CoralReefsPub2009.pdf)

Miller, J., R. Waara, A., A. Wright, A. Atkinson, B. Witcher, M. Patterson, K. Whelan, T. Spitzack, C. Rogers, E. Muller, and B. Schill

- 2006 Collaboration in Monitoring Coral Reef Ecosystems in the US Virgin Islands. October 2006 Coral Reef Task Force Meeting. St. Thomas, USVI.

Monaco, Mark E., John D. Christensen, Alan. M. Friedlander, Matt S. Kendall, Chris Caldow

- 2003 Quantifying habitat utilization patterns of U.S. Caribbean and Hawaii reef fish to define marine protected area boundaries: the coupling of GIS and Ecology. Proceedings of the 13th Biennial Coastal Zone Conference, Baltimore MD. July 13 -17, 2003.

Murphy, Larry

- 1985 Trip Report on Activities in Virgin Islands National Park and Buck Island Reef National Monument during the Period September 19-30, 1985. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee, FL.

National Marine Fisheries Service (NMFS), United States Department of Commerce, National Oceanic and Atmospheric Administration

- 2005d Loggerhead sea turtle, *Caretta caretta*, species account. Available on the internet at [http://www.nmfs.noaa.gov/prot\\_res/species/turtles/loggerhead.html](http://www.nmfs.noaa.gov/prot_res/species/turtles/loggerhead.html).

National Oceanographic and Atmospheric Administration

- N/D "Hawksbill Sea Turtle (*Eretmochelys imbricata*)." Available on the internet at <http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.html>

- 2001a Benthic Habitat Mapping of Puerto Rico and the U.S. Virgin Islands [http://ccma.nos.noaa.gov/ecosystems/coralreef/usvi\\_pr\\_mapping.html](http://ccma.nos.noaa.gov/ecosystems/coralreef/usvi_pr_mapping.html).

- 2001b National Oceanic and Atmospheric Association (NOAA)/National Ocean Service (NOS)/National Centers for Coastal Ocean Science (NCCOS)/Center for Coastal Ocean Science (CCMA)/Biogeography Team. Metadata file. Available on the internet at [http://ccma.nos.noaa.gov/ecosystems/coralreef/reef\\_fish.html](http://ccma.nos.noaa.gov/ecosystems/coralreef/reef_fish.html)

- 2001 St. Croix, USVI Habitat Assessment and Monitoring Data (2001-Present). NOAA's Ocean Service, National Centers for Coastal Ocean Science (NCCOS). Available on the internet at [http://ccma.nos.noaa.gov/ecosystems/coralreef/reef\\_fish.html](http://ccma.nos.noaa.gov/ecosystems/coralreef/reef_fish.html)

- 2005 Data analysis conducted for the National Park Service including data from NOAA 2001 aerial mapping survey as presented in Kendall et al. (2001).

- 2006b NOAA's National Centers for Coastal Ocean Science. Caribbean Coral Reef Ecosystem Monitoring . Available on the internet at [http://www8.nos.noaa.gov/biogeography\\_public/query\\_habitat.aspx](http://www8.nos.noaa.gov/biogeography_public/query_habitat.aspx).

- 2006c Integrated Ocean and Coastal Mapping (IOCM) Activities Nancy Foster in the Virgin Islands. Habitat mapping missions 2004-2005-2006. NOAA-NOS-NCCOS-CCMA Biogeography Program. Available on the internet at [http://ccma.nos.noaa.gov/products/biogeography/usvi\\_nps\\_2006/documentation.html](http://ccma.nos.noaa.gov/products/biogeography/usvi_nps_2006/documentation.html)

- 2006d Coral bleaching and recovery observed at Buck Island, St. Croix, US Virgin Islands, October and December, 2005. NOAA Biogeography Team SSMC-4 N/SCI-1. Available on the internet at [http://ccma.nos.noaa.gov/products/biogeography/coral\\_bleaching/welcome.html](http://ccma.nos.noaa.gov/products/biogeography/coral_bleaching/welcome.html)
- 2008 The State of Coral Reef Ecosystems of the U.S. Virgin Islands. Available on the internet at <http://ccma.nos.noaa.gov/ecosystems/coralreef/coral2008/pdf/USVI.pdf>

National Park Service, United States Department of the Interior

- 2000a *Directors Order #53: Special Park Uses and Reference Manual*. Washington D.C.
- 2000b *National Environmental Policy Act Compliance, Environmental Assessment for Buck Island Reef National Monument Visitor Use Facilities, Pier Replacement Diedrich's Picnic Shelter Reconstruction and West Beach and Diedrich's Restroom Repair* by Zandy Hillis-Star, Division of Natural Resources, Buck Island Reef National Monument.
- 2001 Directors Order 12: Conservation Planning, Environmental Impact Analysis and Decision-making handbook
- 2002a The Eradication of Introduced Rats at Buck Island Reef National Monument, St. Croix, U.S. Virgin Islands – Final Report. November 1, 2002
- 2002c Buck Island Reef National Monument Public Use Reporting and Counting Instructions, January 1, 2002.
- 2003 NOAA State of the Reef Report 2003. Memorandum from Zandy Hillis-Starr to the National Oceanic and Atmospheric Administration. BUIS Coral Reef and Related Information for 2003 Report. December, 2003.
- 2004a *Environmental Assessment for Buck Island Reef National Monument St. Croix, U.S. Virgin Islands, Control and Management of Non-Native Invasive Plants*. Prepared by Daniel Clark, Supervisory Exotic Plant Specialist, Florida/Caribbean Exotic Plant Management Team and Zandy Hillis-Starr, Chief Resource Management, Christiansted NHS/Buck Island Reef National Monument/Salt River Bay National Historic Place, and Ecological Preserve, St. Croix, Virgin Islands.
- 2004b Interview, Allen Bohnert, Chief, Museum Services, Southeast Region, NPS. National Park Service, Atlanta, February 11, 2004.
- 2005 Personal communication with Zandy Hillis-Starr, NPS.
- 2006a National Park Service Management Policies. United States Department of the Interior. Washington D.C.
- 2006b Draft South Florida and Caribbean Parks Exotic Plant Management Plan and Environmental Impact Statement. Available at Buck Island Reef National Monument Headquarters. St. Croix, VI.
- 2006c Miller, J. , A. Atkinson, J. Patterson, K. R. T., R. Waara, Whelan, B. Witcher, and A. Wright. Coral Reef Monitoring Protocol. Prepared by National Park Service South Florida/Caribbean Network LandM Program. Powerpoint presentation.
- 2007 South Florida / Caribbean Network Vital Signs Monitoring Plan – Phase 3 Report. Draft. National Park Service Natural Resource Program Center. Natural Resource Report NPS/SER/SFCN/NRR-2007/001. December 15, 2007.
- 2008a South Florida / Caribbean Network Vital Signs Monitoring Plan, Natural Resource Report NPS/SFCN/NRR—2008/063.

- 2008b Environmental Assessment, Collection and Re-introduction of Endangered Endemic St. Croix Ground Lizard, *Ameiva polops*, to Buck Island Reef National Monument, St. Croix, U. S. Virgin Islands. Prepared by National Park Service, U.S. Fish and Wildlife Service, and Virgin Islands Department of Planning and Natural Resources, March 10, 2008.
- 2009 NPS Public Use Statistics Office. Available on the internet at <http://www.nature.nps.gov/stats/>.
- 2010 South Florida and Caribbean Parks Exotic Plant Management Plan and Environmental Impact Statement. Available at Buck Island Reef National Monument Headquarters. St. Croix, VI.

## Nemeth, R.S. and J. Sladek-Nowlis

- 2001 Monitoring the effects of land development on the near-shore reef environment of St. Thomas, USVI. *Bulletin of Marine Science* 69: 759-775. In Waddell, J.E. (ed.). 2005. *The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005*. NOAA Technical Memorandum NOS NCCOS 11. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 522 pp.)

## Nicholls, T.J.

- 2002 *Rising Sea Levels: Potential Impacts and Responses*. *Issues and Environmental Science and Technology*, No. 17. Global Environmental Change. Royal Society of Chemistry.

## Nova University

- 2005 2005 BUIS/NSU Fish Inventory: Collection Completion Notes. October, 2005.

## Novotny, V. and G. Chesters

- 1981 *Handbook of Nonpoint Pollution: Sources and Management*, Van Nostrand Reinhold, New York, New York.
- 1974a *Resources Management Plan, Buck Island Reef National Monument* by Carroll J. Schell.
- 1974b Memo from Acting Regional Director, Southeast Region, to Superintendents, Southeast Region, National Park Service, Atlanta, December 26.
- 1997 *Inventory and Monitoring Program Annual Report Fiscal Year 1997*. National Park Service, Natural Resource Information Division.
- 1999a *Baseline Water Quality Data, Inventory and Analysis for Buck Island Reef National Monument Christiansted National Historic Site and Salt River Bay National Historical Park and Ecological Preserve*. National Park Service, Water Resources Division, Fort Collins.

## The Ocean Conservancy

- 2006 *The State of the Coral Reefs of the U.S. Virgin Islands*. The Ocean Conservancy.

## Ogden, J.C. and P.S. Lobel

- 1978 The role of herbivorous fishes and urchins in coral reef communities. *Env. Biol. Fish.* 3(1):49-63. In U.S. Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife. December 2005. United States Virgin Islands Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan.

Pittman, Simon J., S.D. Hile, C FG Jeffery, C. Caldw, M. Kendall, M. Monaco, Z. Hillis-Starr.

- 2008 Fish Assemblages and Benthic Habitats of Buck Island Reef National Monument (St. Croix, U.S. Virgin Islands) and the Surrounding Seascape: A Characterization of Spatial and Temporal Patterns. Biogeography Branch, Center for Coastal Monitoring and Assessment, NOAA/ NOS/ National Centers for Coastal Ocean Science. Silver Spring, MD. NOAA Technical Memorandum NOS NCCOS 71. May 2008.

Pollock, D.A. and M.A. Ivie

- 1996 Anthicidae Coleoptera of the Virgin Islands. Florida Entomologist 79:230-240.

Prokopetz, A. Wayne

- 1976a Archeological Survey of Buck Island Reef National Monument St. Croix, U. S. Virgin Islands. Manuscript on File, National Park Service, National Park Service, Southeast Archeological Center, Tallahassee, FL.
- 1976b Effects of Archeological Investigations Undertaken by the National Park Service on the Archeological and Historical Resources of Buck Island Reef National Monument, United States Virgin Islands – Section 106 Statement. SEAC ACC. 198. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee, FL.
- 1976c Trip Report, Archeological Survey of Buck Island National Monument. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee, FL.

Ray, Gary

- 2003 Vascular Plant Inventory and Mapping of Buck Island Reef National Monument, St. Croix, U.S. Virgin Islands. Task Order Number Two (2)L J5000 01 0642 Under agreement between the University of the Virgin Islands and the National Park Service.

Riegl, B. and R.E. Dodge

- 2008 Introduction: A diversity of oceans, reefs, people, and ideas: a perspective of US coral research. In: Riegl B, Dodge RE (eds) Coral Reefs of the USA. Springer-Verlag, Dordrecht, 1-9.

Righter, Elizabeth

- 1985 Report on Systematic Subsurface Archaeological Testing of Site 12Vam1-68 Buck Island, ST. Croix, U.S. Virgin Islands and Pedestrian Survey of Selected Section of the Island. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee, FL.
- 1992 Statewide Comprehensive Historic Preservation Plan: Prehistoric Context (draft). Division for Archaeology and Historic Preservation, Department of Planning and Natural Resources, St. Thomas, USVI. Prepared for the Southeast Regional Office, National Park Service, Atlanta, GA.
- 1995 A Critical Look at Prehistoric Site Distribution in the U.S. Virgin Islands: 1995. Proceedings of the International Congress for Caribbean Archaeology 16:52-64 Basse Terre, Guadeloupe.

Rigsarkivet

- 1742-1917 St. Croix Mandtals, Landlister and Matriculs. Rigsarkivet, Copenhagen, Denmark.
- 1792 St. Croix Plantation Statistics. Documenter Vedrorende Kommissionen for Negerhandelens Bedre Indretning & Ophaevelse I 1783-1806. Generaltoldkammeret Arkiver, Copenhagen, Denmark.

Rogers, Caroline S.

- 1990 Responses of Coral Reefs and Reef Organisms to Sedimentation. Marine Ecology Progress Series, Vol. 62: 185-202.

Rogers, C.S., T. Suchanek and F. Pecora

- 1982 Effects of Hurricanes David and Frederic (1979) on shallow *Acropora palmata* reef communities: St. Croix, USVI. Bulletin of Marine Science 32: 532-548. In Waddell, J.E. (ed.). 2005. The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005. NOAA Technical Memorandum NOS NCCOS 11. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 522 pp.)

Rogers, C.S., Miller, J. and Waara R

- 2002 Tracking changes on a reef in the US Virgin Islands with videography and SONAR: a new approach. In: Proceedings of the 9th International Coral Reef Symposium, ed. K. Moosa. Bali, Indonesia: Research and Development Center for Oceanography: (in press). In Rogers, C.S. and Beets, J. (2001) Degradation of marine ecosystems and decline of fishery resources in marine protected areas in the US Virgin Islands. Environmental Conservation 28 (4): 312-322.

Rogers, C.S., W. Gladfelter, D. Hubbard, E. Gladfelter, J. Bythell, R. Dunsmore, C. Loomis, B. Devine, Z. Hillis-Starr and B. Phillips.

- 2002 *Acropora* in the U.S. Virgin Islands: A Wake or an Awakening? A Status Report Prepared for the National Oceanographic and Atmospheric Administration. pp. 99 – 122. In: A.W. Bruckner, A. (ed.) NOAA Technical Memorandum NMFS-OPR-24. National Oceanic and Atmospheric Administration, Silver Spring, MD.

Rogers, C.S., W. Gladfelter, D. Hubbard, E. Gladfelter, J. Bythell, R. Dunsmore, C. Loomis, B. Devine, Z. Hillis-Starr, and B. Phillips

- 2006 *Acropora* in the U.S. Virgin Islands: A Wake or an Awakening? A Status Report Prepared for the National Oceanographic and Atmospheric Administration. White paper.

Rogers, C.S. and J. Beets

- 2001 Degradation of marine ecosystems and decline of fishery resources in marine protected areas in the U.S. Virgin Islands. Environmental Conservation 28(4):312-322. In U.S. Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife. 2005. United States Virgin Islands Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan. December 2005. In United States Virgin Islands Marine Resources and Fisheries Strategic and Comprehensive Conservation Plan. Division of Fish and Wildlife, Department of Planning and Natural Resources, US Virgin Islands. December 2005.

Rogers, C. S. and R. Teytaud

- 1988 Marine and Terrestrial Ecosystems of the Virgin Islands National Park and Biosphere Preserve. U.S. Department of Interior, National Park Service and Virgin Islands Resource Management Cooperative, Virgin island national Park, and Islands Resources Foundation. September 1988.

Rothenberger, P., Jeremiah Blondeau, Carrollyn Cox, Sustain Curtis, William S. Fisher, Virginia Garrison, Zandy Hillis-Starr, Christopher F.G. Jeffery, Elisabeth Kadison, Ian Lundgren, W. Jeffery Miller, Erinn Muller, Richard Nemeth, Shona Patterson, Caroline Rogers, Tyler Smith, Anthony Spitzack, Marcia Tylor, Wesley Toller, Julie Wright, Dana Wusinich-Mendez, and Jeannetter Waddell. Pp In Miller, M.W., A. Gleason, D. McClellan, G. Piniak, D. Williams, J.W. Wiener, A. Gude, J. Schwagerl.

- 2008 The State of Coral Reef Ecosystems of Navassa Island. Pp. 117-129. In: J.E. Waddel and A.M. Clarke (eds.), *The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2008*. NOAA Technical Memorandum NOS NCCOS 73. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring MD. 569 pp.

Rouse, Irving

- 1992 *The Tainos: Rise and Decline of the People who Greeted Columbus*. Yale University Press, New Haven and London.

Sampson, R

- 1997 *Precipitation, Runoff and Sediment Yield on St. John - A Review of the Data*, 319 Project Report to Island Resources Foundation, February, 1997, St. Thomas, U.S. Virgin Islands.

Schueler, T.R.

- 1987 *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*, Metropolitan Washington Council of Governments, Department of Environmental Programs, Washington, DC. Publication Number 87703.

Smith-Vaniz WF, Jelks HL, Rocha LA.

- 2006 *Relevance of cryptic fishes in biodiversity assessments: A case study at Buck Island Reef National Monument, St. Croix*. *Bulletin of Marine Science* 79: 17-48.

Hillis-Starr, Zandy

- 2004 Personal communication with Parsons regarding relationship between methods of non-native invasive vegetation removal and erosion rates on Buck Island.
- 2006 Personal communication with Parsons regarding the presence of the loggerhead sea turtle at Buck Island.
- 2009 Personal communication with Parsons regarding existing conditions.
- 2010 Personal communication with Parsons regarding invasive Lionfish.

Stern, N.

- 2006 *The Stern Review – On the Economics of Climate Change*. Available on the internet at [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/sternreview\\_index.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm)

Sutherland, K. P., J. W. Porter, and C. Torres

- 2004 *Disease and immunity in Caribbean and Indo-Pacific zooxanthellate corals*. *Mar. Ecol. Prog. Ser.* 266:273-302.

Tobias, W., E. Telemaque and M. Davis

- 1988 *Buck Island Fish and Shellfish Populations*. Virgin Islands Resource Management Cooperative. Biosphere Reserve Research Report N. 26. Virgin Islands National Park. September, 1988. 26 pp.

Towle, Edward L., Robert F. Marx, and Alan B. Albright

- 1976 Shipwrecks of the Virgin Islands: an Inventory (1523-1825). Second edition. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee. Originally published in 1969.

Turgeon, D.D., R.G. Asch, B.D. Causey, R.E. Dodge, W. Jaap, K. Banks, J. Delaney, B.D. Keller, R. Speiler, C.A. Matos, J.R. Garcia, E. Diaz, D. Catanzaro, C.S. Rogers, Z. Hillis-Starr, R. Nemeth, M. Taylor, G.P. Schmahl, M.W. Miller, D.A. Gulko, J.E. Maragos, A.M. Friedlander, C.L. Hunter, R.S. Brainard, P. Craig, R.H. Richond, G. Davis, J. Starmer, M. Trianni, P. Houk, C.E. Birkeland, A. Edward, Y. Golbuu, J. Gutierrez, N. Idechong, G. Pauly, A. Tafleichig, and N. Vander Velde.

- 2002 The State of Coral Reef Ecosystems of the U.S. and Pacific Freely Associated States: 2002. NOAA/NOS/NCCOS, Silver Spring, MD. 265pp.

Tyson, George F.

- 1983 Register of Virgin Islands' Shipwrecks. Manuscript on File, National Park Service, Southeast Archeological Center, Tallahassee.

Tyson George F.

- 1997 The Plantation System of the Virgin Islands; An Overview. Draft. Ms. On file at VISHPO.

United Nations Environment Programme

- 2007 Global Environment Outlook GE04.

United States Climate Change Science Program

- 2008 Weather and LCimate Extremes in a Changing Climate. Regions of Focus: North America, Hawaii, Caribbean, and U.S. Pacific Islands. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Thomas R. Karl, Gerald A. Meehl, Christopher D. Miller, Susan J. Hassol, Anne M. Waple, and William L. Murray (eds.). Department of Commerce, NOAA's National Climatic Data Center, Washington, D.C. USA, 164 pp.

United States Department of Agriculture

- 1998 *Soil Survey of the United States Virgin Islands*. U.S. Department of Agriculture, Natural Resources Conservation Service, in cooperation with the Virgin Islands Department of Planning and Natural Resources; the Virgin Islands Cooperative Extension Service; and the United States Department of Interior, National Park Service. Interim Publication.

United States Department of Agriculture

- 2002 *Soil Survey of the United States Virgin Islands*. Washington, DC: National Cooperative Soil Survey.U.S.

United States Environmental Protection Agency

- 2008 Climate Change, Basic Information. Available on the Internet at <http://www.epa.gov/climatechange/basicinfo.html>.

United States Fish & Wildlife Service

- 1995 "Brown Pelican." Prepared by the Division of Endangered Species. In *Endangered and Threatened Species of the Southeaster United States (The Red Book) FWS Region 4, As of 1/95*. Available on the internet at <http://www.fws.gov/endangered/i/b/sab2s.html>



U.S. Geological Survey

- 2004 Delivery, deposition, and effects of land based sediments on corals in St. John, U.S. Virgin Islands. Water Resources Research Grant Proposal. Available on the internet at [www.water.usgs.gov/wrri/99projects,state/virginislands.htm](http://www.water.usgs.gov/wrri/99projects,state/virginislands.htm).

University of the Virgin Islands

- 2004 V.I. NPS Update. Available on the internet at <http://rps.uvi.edu/ces/npsupdate.htm>.

Valle-Esquivel, M.

- 2002 Standardized Catch Rates and Preliminary Assessment Scenarios for Queen Conch (*Strombus gigas*) in the U.S. Caribbean. NOAA National Marine Fisheries Service Southeast Fisheries Science Center Sustainable Fisheries Division Contribution No. SFD-02/03-184 November 2002 Rosenstiel School of Marine and Atmospheric Science, Division of Marine Biology and Fisheries, University of Miami, Miami, Florida.

Vescelius, Gary S.

- 1952 The Cultural Chronology of St. Croix. B.A. Thesis, Department of Anthropology, Yale University, New Haven, CT.

VISHPO

- 2002 The Virgin Islands State Historic Preservation Plan for 2003-2008. The Virgin Islands State Historic Preservation Office. Department of Planning and Natural Resources, Frederiksted, USVI.

Waddell, J.E. (ed.)

- 2005 The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2005. NOAA Technical Memorandum NOS NCCOS 11. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team. Silver Spring, MD. 522 pp. Available on the internet at [http://ccma.nos.noaa.gov/ecosystems/coralreef/coral\\_report\\_2005/CoralReport2005\\_C.pdf](http://ccma.nos.noaa.gov/ecosystems/coralreef/coral_report_2005/CoralReport2005_C.pdf)

Waddle, J.H. and K.G. Rice

- 2002 Herpetological Inventory of Buck Island Reef National Monument. Final Report. U.S. Geological Survey, Florida Caribbean Science Center. 22 pp.

Wernicke, W., A. Seymour and R. Mangold.

- 1986 Sediment Study in the St. Thomas, St. Croix Areas of the United States Virgin Islands, Donald E. Hamlin Consulting Engineers, Prepared for the V.I. Department of Conservation and Cultural Affairs.

Westergaard, Waldemar C.

- 1917 The Danish West Indies under Company Rule (1671-1754), with a supplementary chapter, 1755-1917. The Macmillan Company, New York.

Witmer, G. W., F. Boyd, and Z. Hillis-Starr

- 2007 The successful eradication of introduced roof rats (*Rattus rattus*) from Buck Island Reef using diphacinone, followed by an eruption of house mice (*Mus musculus*). *Wildlife Research*, 34, 108-115.

Woodbury, Roy O and Elbert L. Little, Jr.

- 1976 *Flora of Buck Island Reef National Monument (U.S. Virgin Islands)*. Forest Service Research Paper ITF-19 Institute of Tropical Forestry, Rio Piedras, Puerto Rico.

Worm, B., E. B. Barbier, N. Beaumont, J. E. Duffy, C. Folke, B. S. Halpern, J. C. Jackson, H. K. Lotze, F. Micheli, S. R. Palumbi, E. S. Kimberley, A. Selkoe, J. J. Stachowicz, R. Watson

2006 Impacts of Biodiversity Loss on Ocean Ecosystem Services. *Science* Vol 314 (3) November 2006).

Wright, Julie A.

2002 Virgin Islands Environmental Protection Handbook, published by the University of the Virgin Islands Cooperative Extension Service.

## GLOSSARY OF TERMS

The controlling definitions for terms under the President's Council on Environmental Quality National Environmental Policy Act regulations are contained at 40 Code of Federal Regulations; the numbers in parentheses refer to the appropriate section. These definitions are provided as a supplement to those regulatory definitions.

**Aesthetic resources** — The intangible perceptions possible in parks, such as natural quiet, solitude, and the experience of nighttime skies.

**Categorical exclusion (1508.4)** — An action with no measurable environmental impact which is described in one of the categorical exclusion lists in section 3-3 or 3-4 and for which no exceptional circumstances (section 3-5) exist.

**Connected actions (1508.25)** — Actions that are closely related. They automatically trigger other actions that have environmental impacts; they cannot or will not proceed unless other actions have been taken previously or simultaneously, or they are interdependent parts of a larger action and/or depend on the larger action for their justification.

**Conservation planning and impact assessment** — Within the National Park Service, this process is synonymous with the National Environmental Policy Act process. This process evaluates alternative courses of action and impacts so that decisions are made in accord with the conservation and preservation mandate of the NPS Organic Act.

**Cooperating agency (1508.5)** — A federal agency other than the one preparing the National Environmental Policy Act document (lead agency), that has jurisdiction over the proposal by virtue of law or special expertise and that has been deemed a cooperating agency by the lead agency. State or local governments and/or Indian tribes, may be designated cooperating agencies as appropriate (see 1508.5 and 1502.6).

**Cultural resources (NPS-28, appendix A)** — Aspects of a cultural system that are valued by or significantly representative of a culture or that contain significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as districts, sites, buildings, structures, and objects for the National Register of Historic Places and as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources for NPS management purposes.

**Cumulative actions (1508.25)** — Actions that, when viewed with other actions in the past, the present, or the reasonably foreseeable future, regardless of who has undertaken or will undertake them, have an additive impact on the resource the proposal would affect.

**Cumulative impact (1508.7)** — The impacts of cumulative actions.

**Direct effect (1508.8)** — An impact that occurs as a result of the proposal or alternative in the same place and at the same time as the action.

**Environmental assessment (EA) (1508.9)** — A brief National Environmental Policy Act document that is prepared to, (a) help determine whether the impact of a proposal or alternatives could be significant; (b) aid the National Park Service in compliance with the National Environmental Policy Act by evaluating a proposal that will have no significant impacts, but that may have measurable adverse impacts; or (c) evaluate a proposal that either is not described on the list of categorically excluded actions, or is on the list but exceptional circumstances (section 3-5) apply.

**Environmental impact statement (EIS) (1508.11)** — A detailed National Environmental Policy Act document that is prepared when a proposal or alternatives have the potential for significant impact on the human environment.

Environmental screening process — The analysis that precedes a determination of the appropriate level of National Environmental Policy Act documentation. The minimum requirements of the environmental screening process are a site visit, consultation with any agency that has jurisdiction by law or special expertise, and the completion of a screening checklist. The process must be complete for all NPS actions that have the potential for environmental impact and are not described in section 3-3.

Environmentally preferred alternative (1505.2, Q6a) — Of the alternatives analyzed, the one that would best promote the policies in the National Environmental Policy Act section 101. This is usually selected by the interdisciplinary team members. It is presented in the NPS National Environmental Policy Act document (draft and final environmental assessment or environmental impact statement) for public review and comment.

Essential Fish Habitat — Under the Magnuson-Stevens Fishery Conservation and Management Act (50 CFR 600.100) essential fish habitat is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.”

Exceptional circumstances — Circumstances that, if they apply to a project described in the NPS categorical exclusion lists (sections 3-3 and 3-4), mean a categorical exclusion is inappropriate and an environmental assessment or an environmental impact statement must be prepared because the action may have measurable or significant impacts. Exceptional circumstances are described in section 3-5.

Finding of no significant impact (FONSI) (1508.13) — A determination based on an environmental assessment and other factors in the public planning record for a proposal that, if implemented, would have no significant impact on the human environment.

General Management Plan (GMP) — Broad decisions about the kinds of resource conditions and visitor experiences the park should provide over the long term.

Human environment (1508.14) — Defined by the Council on Environmental Quality as the natural and physical environment and the relationship of people with that environment (1508.14). Although the socioeconomic environment receives less emphasis than the physical or natural environment in the Council on Environmental Quality regulations, the National Park Service considers it an integral part of the human environment.

Impact topics — The specific natural, cultural, or socioeconomic resources that would be affected by the proposed action or alternatives (including no action). The magnitude, duration, and timing of the effect to each of these resources are evaluated in the impact section of an environmental assessment or environmental impact statement.

Implementation Plan — Any of a great variety of plans, such as resource management plans, comprehensive interpretive plans, collection management plans, concession management plans, visitor experience and resource protection (VERP) plans, comprehensive interpretive plans, backcountry management plans, wilderness management plans, site development plans, river management plans, and historic structure reports, that specify how a project or activity should be implemented.

Indirect impact (1508.8) — Reasonably foreseeable impacts that occur removed in time or space from the proposed action. These are “downstream” impacts, future impacts, or the impacts of reasonably expected connected actions (e.g., growth of an area after a highway is complete).

Input — Something, like money or manpower, needed to produce a product or conduct an activity. The Government Performance and Results Act makes a distinction between outcomes (results), outputs (efforts/products/activities), and inputs (money, manpower, and other things needed to produce an output).

**Interpretation** — The translation of scientific and academic information about park resources into forms that are meaningful to the public, helping them understand and appreciate their natural and cultural heritage.

**Issues** — In the National Environmental Policy Act, issues are environmental, social, and economic problems or effects that may occur if the proposed action or alternatives (including no action) are implemented or continue to be implemented.

**Law** — The U.S. Congress directs the National Park Service and other federal agencies to carry out certain activities or to achieve certain conditions that it specifies in laws. The National Park Service must comply with these laws and may be sued in court for failure to comply.

**Lead agency (1508.16)** — The agency either preparing or taking primary responsibility for preparing the National Environmental Policy Act document.

**Life Cycle Costing (Analysis)** — An accounting method that analyzes the total costs of a product or service, including construction, maintenance, manufacturing, marketing, distribution, useful life, salvage, and disposal.

**Management Prescription** — A decision about what kinds of resource conditions and visitor experiences should occur in a particular location within a park. Prescriptions are established for each distinctive location (management zone) within a park and specify (1) the desired condition of natural and cultural resources, (2) the desired visitor experience, (3) appropriate kinds and levels of management activities, (4) appropriate kinds and levels of visitor activities, and (5) appropriate kinds and levels of development.

**Management Zone** — An area within a park that will be managed distinctively from other areas, to achieve different resource conditions and visitor experiences.

**Major federal action (1508.18)** — Actions that have a large federal presence and that have the potential for significant impacts to the human environment. They include adopting policy, implementing rules or regulations; adopting plans, programs, or projects; ongoing activities; issuing permits; or financing projects completed by another entity.

**Marine reserve (NOAA 2010)**—On April 22, 2009, NOAA and DOI announced formation of the National System of Marine Protected Areas (MPAs). MPAs are managed and administered by the specific department and agency with authority over the site. Inclusion of the site in the National System of MPAs does not interfere with the independent exercise of that authority, nor does it provide additional regulatory authority. However, inclusion in the National System provides official recognition of the site’s contribution to marine cultural and natural resource protection goals.

Marine Reserves are a special category of marine protected areas that restrict or completely prohibit extractive activities (most marine protected areas allow multiple uses.) “No-take” Marine Reserves are effective management tools used to protect, maintain or restore ocean and coastal fish populations and habitats degraded by overfishing. Marine Reserves result in long-lasting and often rapid increases in the abundance, diversity and productivity of marine species, including important keystone species that support healthy ecological functioning of marine ecosystems. Scientific evidence is growing that networks of marine reserves within large geographic areas increase the persistence and resilience of marine ecosystems to climate change. “No-take” marine reserves have been established at Dry Tortugas National Park, Virgin Islands Coral Reef National Monument, Buck Island Reef National Monument, and Channel Islands National Park. Only about one percent of U.S. territorial waters and less than one-tenth of one percent of the world’s oceans are protected in Marine Reserves. Executive Order 13158 also directs DOI and NOAA to support a biological assessment of the minimum area where consumptive uses would be prohibited that is necessary to preserve representative habitats in different geographic areas of the marine environment.

Memo to file — A memo to the planning record or statutory compliance file that NPS offices may complete when (a) National Environmental Policy Act has already been completed in site-specific detail for a proposal, usually as part of a document of larger scope, or (b) a time interval has passed since the National Environmental Policy Act document was approved, but information in that document is still accurate.

Mitigated Environmental Assessment (Q40) — An environmental assessment that has been rewritten to incorporate mitigation into a proposal or to change a proposal to reduce impacts to below significance.

Mitigation (1508.20) — A modification of the proposal or alternative that lessens the intensity of its impact on a particular resource.

Natural resources — The ecological features of a park, such as geologic forms and processes, communities of native plants and animals and the processes that sustain them (natural succession, natural fire, natural flood/drought cycles, etc.), air quality and air quality related values such as visibility, water bodies and hydrologic processes, and paleontological remains.

National Environmental Policy Act process — The objective analysis of a proposal to determine the degree of its environmental and interrelated social and economic impacts on the human environment, alternatives and mitigation that reduce that impact, and the full and candid presentation of the analysis to, and involvement of, the interested and affected public.

Notices of availability — Separate notices submitted to the Federal Register that the draft environmental impact statement and the final environmental impact statement are ready for distribution.

Notice of intent (1508.22) — The notice submitted to the Federal Register that an environmental impact statement will be prepared. It describes the proposed action and alternatives, identifies a contact person in the National Park Service, and gives time, place, and descriptive details of the agency's proposed scoping process.

Outcome — A result, usually expressed in terms of resource conditions or visitor experiences. The Government Performance and Results Act makes a distinction between outcomes (results), outputs (efforts/products/activities), and inputs (money, manpower, and other things needed to produce an output).

Output — An effort, product, or activity. The Government Performance and Results Act makes a distinction between outcomes (results), outputs (efforts/products/activities), and inputs (money, manpower, and other things needed to produce an output).

Park — For the purposes of this document, the terms national park or park refer to any unit of the national park system. Although national park system designations formally categorize units as national parks, national preserves, national monuments, national historic sites, national historical parks, national memorials, national recreation areas, national lakeshores, national seashores, national rivers, national battlefields, or national cemeteries, all units of the national park system are managed under a single set of laws and policies with the only distinctions being special mandates included in the specific legislation applying to each particular unit.

Park purpose — The reasons why a park is so important that it has been set aside as a unit of the national park system.

Park significance — The relative international, national, or regional importance of the resources that contributed to the park's addition to the national park system

Plan — The documentation of a decision or decisions and all the factors that were considered during the decision making. The National Park Service produces four kinds of plans: general management

plans, strategic plans, implementation plans, and annual performance plans. Each of these is described separately in the glossary.

Planning — Structured decision making.

Policy — The National Park Service establishes specific criteria and procedures for how it will conduct its activities and carry out its mission. These policies apply to all NPS activities in all units of the National Park System. Park managers must comply with NPS policies, and the National Park Service may be sued in court for failure to comply with its own policies.

Preferred alternative (1502.14 (e)) — The alternative an NPS decision-maker has identified as preferred at the draft environmental impact statement stage or environmental assessment. Identification of the preferred alternative helps the public focus its comments during review of the National Environmental Policy Act document.

Programmatic documents — Broader scope environmental assessments or environmental impact statements that describe the impacts of proposed policy changes, programs, or plans.

Proposal (1508.23) — The stage at which the National Park Service has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal. The goal can be a project, plan, policy, program, and so forth. The National Environmental Policy Act process begins when the effects can be meaningfully evaluated.

Regulation — Federal agencies establish specific criteria and procedures for how they will comply with laws. These regulations must be reviewed and approved through a formal process, then they are compiled in the Code of Federal Regulations (CFR). The National Park Service must comply with all applicable federal regulations, including those promulgated by other agencies having legal jurisdiction over certain aspects of all federal activities, and it may be sued in court for failure to comply.

Record of decision (1505.2) — The document that is prepared to substantiate a decision based on an environmental impact statement. It includes a statement of the decision made, a detailed discussion of decision rationale, and the reasons for not adopting all mitigation measures analyzed, if applicable.

Resource — Something of value (an asset). Park managers often speak in terms of the aesthetic, cultural, and natural resources of parks, meaning the parks' major features. [See also aesthetic resource, cultural resource, and natural resource.] The term is also used less frequently to describe the funding and manpower available to managers.

Scoping (1508.25) — Internal NPS decision-making on issues, alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, lead and cooperating agency roles, available references and guidance, defining purpose and need, and so forth. External scoping is the early involvement of the interested and affected public.

Self Contained Underwater Breathing Apparatus (SCUBA) — A portable apparatus containing compressed air that is used to breathe underwater.

Strategic Plan — A plan describing what a park staff hopes to achieve within the next six years. These plans, required by the Government Performance and Results Act, should include measurable results-oriented goals that the park staff can use to prioritize work and measure progress.

Tiering (1508.28) — The use of broader, programmatic National Environmental Policy Act documents to discuss and analyze cumulative regional impacts and define policy direction, and the incorporation by reference of this material in subsequent, narrower documents to avoid duplication and focus on issues “ripe for decision” in each case.

Vessel — Under 36 Code of Federal Regulations 1.4, vessels are defined as every type or description of craft, other than a seaplane on the water, used or capable of being used as a means of transportation on water, including a buoyant device permitting or capable of free flotation.