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## Elizabeth A. BURGESS, Ph.D.

*Senior Scientist & Chair, Wildlife and Ocean Health Program*

Anderson Cabot Center for Ocean Life at the New England Aquarium

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### OVERVIEW:

Dr. Liz Burgess is a conservation physiologist specializing in noninvasive approaches to assessing the health of marine wildlife. She leads the development and application of endocrine tools to measure stress, reproduction, and overall physiological condition in free-ranging animals, with a focus on species that are difficult to study directly.

With more than two decades of experience working with large vertebrates – particularly marine mammals – Liz integrates a wide range of research approaches, including boat-based, in-water, aerial, and necropsy-based methods, across Australia, New Zealand, and the United States. In recent years, she has been a leader in applying endocrinology to marine species, including baleen whales, sperm whales, beaked whales, dugongs, manatees, and sea turtles.

Her work advances innovative methods to quantify hormones across multiple biological matrices – including feces, blubber, baleen, blood, and exhaled respiratory vapor (“blow”). By integrating field collection, laboratory assay development, and analytical approaches, she generates meaningful insights into individual health and population dynamics.

Liz’s research directly informs conservation and management by linking physiological condition to population-level outcomes. Her work contributes to frameworks such as Population Consequences of Disturbance (PCoD) and supports efforts to monitor, manage, and recover vulnerable species in a rapidly changing ocean.

### ACADEMIC EDUCATION:

- 2007–2012    Doctor of Philosophy – The University of Queensland, Brisbane, Australia  
Thesis: *Determination of critical reproductive parameters of live, wild dugongs (Dugong dugon) in a subtropical environment*
- 2006–2007    Master of Science, awarded with First Class Honours – Massey University, Auckland, New Zealand  
Thesis: *Foraging ecology of common dolphins (Delphinus sp.) in the Hauraki Gulf*
- 1997–2001    Bachelor of Science with First Class Honours – The University of Queensland, Brisbane, Australia  
Thesis: *Effect of incubation temperature on the morphology and swimming performance of the green sea turtle (Chelonia mydas) hatchling*

### EMPLOYMENT HISTORY:

**Senior Scientist | Chair of Wildlife and Ocean Health** | Anderson Cabot Center for Ocean Life, New England Aquarium, USA **2024–now**

Liz leads interdisciplinary research that integrates physiology, ecology, and conservation science. Her team develops and applies innovative tools to assess wildlife health and translates these findings into actionable insights for conservation policy, management, and practice.

**Research Scientist | Chair of Wildlife and Ocean Health from Post-doctoral Fellow** | New England Aquarium, USA **2013–2024**

Since 2013, Liz has held a series of scientific leadership roles at the New England Aquarium, advancing from Postdoctoral Fellow to Chair of the Wildlife and Ocean Health Program. Her work, supported in part by the U.S. Office of Naval Research Marine Mammal Biology Program, has driven the development of innovative approaches to assessing marine wildlife health.

**Marine Mammal Observer (Leader or Team member)** | Murdoch University – across Australia | Enquest Pty Ltd in New Zealand, Australian & Kenyan waters | Crown Minerals and Department of Conservation, New Zealand **2005–2013**

Liz has extensive experience as a Marine Mammal Observer across Australia, New Zealand, and Kenya, working across government, consulting, and academic sectors, to support aerial and offshore seismic surveys and advance monitoring and mitigation of human impacts on marine wildlife in operational environments. This work helped shape her interest in understanding physiological responses to disturbance.

**Consultant** | TRAFFIC (IUCN/WWF) the wildlife trade monitoring network **2004–2014**

Liz worked as a consultant with TRAFFIC (WWF/IUCN) and the CITES Secretariat under the United Nations Environment Programme, contributing to investigations of wildlife trade and engaging in regional policy efforts—including workshops and collaboration with governments—across Southeast Asia, East Asia, Melanesia, and Oceania. She pursued this work to engage directly in applied conservation, addressing wildlife exploitation through science-informed policy and action.

**Scientific Researcher** | The University of Queensland, Australia **2002–2003**

At the University of Queensland, Liz initiated and led a Sea World Research & Rescue-funded project examining the effects of incubation temperature and climate variability on hatchling sea turtles. This early work helped catalyze further research in this area and influenced her long-term focus on how environmental change shapes wildlife physiology.

**Team Leader** | EarthWatch: *Sea Turtles of Malaysia Project*, Terengganu, Malaysia **2002**

As Team Leader for the Earthwatch Sea Turtles of Malaysia Project, Liz worked closely with local government in Terengganu and Redang Island on direct, on-the-ground conservation to protect sea turtle eggs from harvest and trade—an experience that reflects her early engagement in applied conservation action.

**Whale-Watch Charter | Supervisor** | Wild Dolphin Care & Research Team, Tangalooma Resort, Moreton Island, Australia **2001–2004**

Liz began her career as a whale-watch commentator and educator at Tangalooma Resort (2001–2004) and was subsequently selected for a supervisory role with the Wild Dolphin Care & Research Team (2001–2002). In this position, she oversaw animal care and program coordination within a permitted dolphin provisioning program, combining hands-on wildlife management with public engagement and education.

**SELECTED PUBLICATIONS (BY RESEARCH THEME):** [full list of publications click here](#)

## **RIGHT WHALE CONSERVATION PHYSIOLOGY & HEALTH**

**Burgess EA** (2020) Ocean Health: Monitoring large whales in a changing ocean. *Maine Boats, Homes and Harbors Magazine* July/August 2020, Issue 165: 56–60. \*\*\*National award winner: Folio Eddie Award 2021\*\*\*

- Burgess EA**, Hunt KE, Kraus SK and Rolland RM (2017) Adrenal responses of large whales: integrating fecal aldosterone as a complementary biomarker. *General and Comparative Endocrinology* 252: 103–110.
- Hunt KE, Ajó AF, Lowe C, **Burgess EA** and Buck CL (2021). A tale of two whales: Putting physiological tools to work for North Atlantic and Southern Right Whales. In: *Conservation Physiology* (eds. Madliger CL, Franklin CE, Love OP and Cooke SJ), Chapter 12. Oxford University Press: Oxford, UK.
- Rolland RM, McLellan WA, Moore MJ, Harms CA, **Burgess EA** and Hunt KE (2017) Fecal glucocorticoids and anthropogenic injury and mortality in North Atlantic right whales (*Eubalaena glacialis*). *Endangered Species Research*. 34: 417–429.
- Pettis HM, Rolland RM, Hamilton PK, Knowlton AK, **Burgess EA** and Kraus SD (2017) Body condition changes arising from natural factors and fishing gear entanglements in North Atlantic right whales, *Eubalaena glacialis*. *Endangered Species Research*. 32: 237–249.

### ADVANCING NONINVASIVE PHYSIOLOGY & METHODS

- Burgess EA** and Lanyon JM (2026) Reproductive science methods for marine mammals. Chapter 17 In: *Reproductive Sciences in Animal Conservation: Progress and Prospects*. Comizzoli et al. (Eds). Springer, New York. In Press.
- Burgess EA**, Hunt KE, Kraus SK and Rolland RM (2018) Quantifying hormones in exhaled breath for physiological assessment of large whales at sea. *Scientific Reports* 8: 10031.
- Burgess EA**, Hunt KE, Kraus SK and Rolland RM (2016). Get the most out of blow hormones: Validation of sampling materials, field storage, and extraction techniques for whale respiratory vapor samples. *Conservation Physiology* 4: cow024.
- Brammer-Robbins E, Cowart JR, Calderon M, **Burgess EA**, Larkin IV and Martyniuk CJ (2024) Sirenian (manatees and dugongs) reproductive endocrinology. *General and Comparative Endocrinology* 356:114575.
- Graham KM, **Burgess EA** and Rolland RM (2021) Stress and reproductive events detected in North Atlantic right whale blubber using a simplified hormone extraction protocol. *Conservation Physiology*. 9: coaa133.

### LONG-TERM MONITORING & MARINE MAMMAL PHYSIOLOGY

- Burgess EA**, Lanyon JM and Brown JL (2013) Sex, scarring, and stress: Understanding seasonal costs in a cryptic marine mammals. *Conservation Physiology* 1: cot014.
- Burgess EA**, Blanshard WH, Barnes AD, Gilchrist S, Keeley T, Chua J and Lanyon JM (2013) Reproductive hormone monitoring of dugongs in captivity: Detecting the onset of sexual maturity in a cryptic marine mammal. *Animal Reproduction Science* 140: 255–267.
- Burgess EA**, Lanyon JM and Keeley T (2012). Testosterone and tusks: Maturation and seasonal reproductive patterns of live free-ranging dugongs (*Dugong dugon*) in a subtropical population. *Reproduction* 143: 683–697.
- Burgess EA**, Lanyon JM, Brown JL, Blyde D and Keeley T (2012). Diagnosing pregnancy in free-ranging dugongs using fecal progesterone metabolite concentrations and body morphometrics: A population assessment. *General & Comparative Endocrinology* 177: 82–92.

### SEA TURTLE PHYSIOLOGY & CONSERVATION

- Burgess EA**, Booth DT and Lanyon JM (2006) Swimming performance of hatchling green turtles is affected incubation temperature. *Coral Reefs* 25: 341–349.

- Booth DT, **Burgess E**, McCosker J and Lanyon JM (2004) The influence of incubation temperature on post-hatchling fitness characteristics of turtles. *International Congress Series* 1275: 226–233.
- Innis CJ, Graham KM, Mott CR, Hart KM, Roche D, Cherkiss MS and **Burgess EA** (2025) Not Just Corticosterone: Further Characterization of the Endocrine Response of Kemp's Ridley Sea Turtles (*Lepidochelys kempii*) Reveals Elevated Plasma Aldosterone Concentrations During Field Capture Events. *Animals* 15(4):600.
- Innis CJ, Graham KM, Perrault JR, Harms CA, Christiansen EF, Dodge KL and **Burgess EA** (2024) Further characterization of adrenocortical and thyroid hormone concentrations of leatherback turtles (*Dermochelys coriacea*) under various stressors, including validation of a plasma aldosterone assay. *Conservation Physiology* 12(1): coae083.
- Innis CJ, Graham KM, Stacy NI, Stacy BA and **Burgess EA** (2024) Endocrine data provide further evidence of physiologic derangement in sea turtles affected by the Deepwater Horizon oil spill. *Endangered Species Research* 53:533-545.
- Innis CJ, Finn S, Kennedy A, **Burgess E**, Norton T, Manire CA and Harms C (2019) A summary of sea turtles released from rescue and rehabilitation in the United States, with observations on re-encounters. *Chelonian Conservation and Biology*. 18: 3–9.

## BEHAVIORAL STUDIES

- Lanyon JM, Athousis C, Sneath HL and **Burgess EA** (2021) Body scarring as an indicator of social function of dugong (*Dugong dugon*) tusks. *Marine Mammal Science*. 30: 962–981.
- Bacon C, Smultea M, Fertl D, Würsig B, **Burgess E** and Hawks-Johnson S (2017) Mixed-Species Associations of Marine Mammals in the Southern California Bight, With Emphasis on Risso's Dolphins (*Grampus griseus*). *Aquatic Mammals*. 43: 177–184.
- McClellan Press K, Mandelman J, **Burgess E**, Cooke SJ, Nguyen VM and Danylchuk AJ (2015). Catching charks: recreational saltwater angler behaviours and attitudes regarding shark encounters and conservation. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 26: 689–702.
- Stockin KA and **Burgess EA** (2005) Opportunistic feeding of an adult humpback whale (*Megaptera novaeangliae*) migrating along the coast of southeastern Queensland, Australia. *Aquatic Mammals* 31: 120–123.

## WILDLIFE TRADE & CONSERVATION POLICY

- Lee SL, **Burgess EA** and Chng SCL (2015) *Hard to Bear: An assessment of trade in bear bile and gall bladder in Malaysia*. TRAFFIC, Petaling Jaya, Selangor, Malaysia p. 50.
- Burgess EA** and Lilley R (2014) *Assessing the Trade in Pig-Nosed Turtles Carettochelys insculpta in Papua, Indonesia*. TRAFFIC, Petaling Jaya, Selangor, Malaysia p. 29.
- Burgess EA**, Stoner SS and Foley K-E (2014) *Brought to Bear: An Analysis of Seizures Across Asia (2000-2001)*. TRAFFIC, Petaling Jaya, Selangor, Malaysia p. 36.
- Lam T, Xu Ling, Takahashi S and **Burgess EA** (2012). *Market Forces: An Examination of Marine Turtle Trade in China and Japan*. TRAFFIC East Asia, Hong Kong, p. 51.
- Kinch J and **Burgess EA** (2009) An assessment of the trade in hawksbill turtles in Papua New Guinea. *TRAFFIC Bulletin* 22: 62–72.
- Ng D and **Burgess EA** (2004) *Against the Grain: The Trade in Musk Deer Products in Singapore and Malaysia*. TRAFFIC Southeast Asia, Malaysia p. 32.
- Shepherd CR, **Burgess EA** and Loo M (2004) *Demand Driven: The Trade of Indian Star Tortoises Geochelone elegans in Peninsular Malaysia*. TRAFFIC Southeast Asia p. 11.