

Welcome to the Anthropocene?

It was probably 10 years ago when I first saw the term “Anthropocene” introduced to define the current epoch in geologic history. I delightfully latched on to it as a perfect descriptor for the rearranged human ecosystem that we now variably enjoy or endure—truly a new age, deserving of its own name! Though we are officially in the Holocene, which is partially defined by human influences itself, I can’t help but see today’s world as substantially re-engineered by human activity, both planned and accidental. What makes this period so exceptional is the rapidity with which change has occurred – centuries compared to the millennia that had shaped prior ages. It’s astonishing that any semblance of a natural ecosystem survives, given all the re-plumbing and holes we’ve poked in it and the fundamental changes of the re-engineered ecosystem “DNA”.

But we do see signs that ecosystem integrity (or health) is deteriorating in ways that we, as scientists and citizens alike, can quantify and agonize over. No corner of the planet has escaped these human effects, whether indirectly from climate change and transport of airborne pollutants, or directly as we till and reshape the landscape to suit our demands for food and shelter. The Global Footprint Network creatively tracks our effect as an “unfortunate milestone” called Earth Overshoot Day. Just as Tax Freedom Day describes the day when you’ve paid off your debt to society (generally April or May), Earth Overshoot Day describes the day when we start deficit spending by liquidating natural resources and ecosystem service assets more quickly than nature can replenish them. In just the last decade, Earth Overshoot Day has migrated from October 21 in 2000 to



Increased density of light clusters show population centers. Major cities are recognizable as bright spots, and sprawl can be seen connecting many of those urban centers.

August 21 in 2010, retreating as quickly as the melting glaciers.

The Great Bay watershed and the Bay itself are far from ecologically bankrupt, though our resource reserves are clearly in decline. Like elsewhere, we struggle to understand the manifestations of nutrient enrichment and climate change in terms of lost natural resources and ecosystem services. Sadly, these natural attributes, critical to our health and well-being as they are to nature, often fall to a lower priority for protection and management when stacked up against socio-economic conditions and demands because their abundance is taken for granted. Pan back to the Anthropocene concept and the sustainability of basic, yet essential, resources such as clean air and water and abundant food and fiber are of diminishing certainty. How do we as scientists, managers and citizens react to this?

Consistent with democratic values, there are many reactions that various interests promote, depending on their stake in the outcome. Some are driven by a love of nature; others by a love of money. In both camps, solutions look simple, and idealism prevails. But, the science tells us that simple solutions to restore, or more appropriately, recreate conditions that previously existed may not be within our reach. Visions of Jurassic Park, or even pre-colonial recreations, can only represent a superficial

change. We are limited by our level of understanding and inability to re-create the underlying ecosystem infrastructure that will support dinosaurs, or even the historic fish communities that are within our ancestral memory. Too much has changed, and Nature has its own designs and responses to our actions that are inherently rational and elegant and never as black and white or linear as our democratic expectations.

This is clearly a time when ecosystem research and management need to be revisited to be sure scientific understanding and management goals and objectives are consistent with those fundamental changes that come with the Anthropocene that has defined a new normal. That is certainly the case for climate change effects, which cannot be adequately mitigated, so we look to adaptation strategies to build resiliency and protect human health and welfare from its most extreme effects. Perhaps it is also the time to review and adjust basic water management protocols where yesterday’s goals and standards may no longer make sense or, worse, be counterproductive. Or maybe simply take the advice of theologians – serenity to accept things we cannot change, courage to change things that we can, and the wisdom to know the difference.

Paul Stacey
Research Coordinator, GBNER

New Addition to Fall Education Program

Volunteer
Spotlight

Every fall, for the past seventeen years, school children from New Hampshire have come to the Center to take part in the Cultural History program at the Great Bay Discovery Center. The lessons incorporated into the program include: how the local Native Americans lived, including their use of plants and animals; the importance of the Gundalow and trading on the estuary; a simulated archaeological dig; and salt marsh farming. Volunteer educators come for a full day of training and are given materials and information for each of the lessons. They are also given supplemental materials to add to their knowledge of the history of the area and lots of tips on how to engage the students.

As the demands on the schools and curriculum have changed over the years, so have the lessons that the Center teaches. Using the state frameworks for history, the fall program includes many of the concepts, materials and information that are part of the curriculum for 4th grade history. This past year Kelle Loughlin, Education Coordinator, and Beth Heckman, Assistant Education Coordinator, attended work sessions on conservation education with other

education staff within Fish and Game. Using the education models put together by the Association of Fish and Wildlife Agencies, the main focus is on the idea of inquiry-based education. Which simply stated is “students pose questions and then plan and conduct investigations to answer those questions. Students use evidence to support their explanations.”

This concept is already a part of the programs at the Center and our volunteers use it to enhance the learning experiences of the many students who attend the spring and fall programs. But this fall will be our real chance to use it in an entirely new part of the Cultural History Program. With the opening of the Special Collections Exhibit, a whole new lesson possibility also opened up. Hunting and fishing in the Great Bay Estuary are an important part of its history and the artifacts and new exhibits reflect that. As the volunteers and staff take groups of students to the Special Collections Exhibit, they will use the artifacts and exhibits to involve the students in answering questions about the importance of hunting and fishing and the methods used and the impact of these activities on the estuary and the people who lived around the Bay. The teachers’ packets that are sent out in advance of the students arriving at the Center will include information and possible ideas about how to prepare the students for this new segment of the program.

Volunteers at the September training will get an in depth tour of the Special Collections Room and learn how to conduct the new activity using inquiry-based questions about the artifacts that will lead students to discover the answers. We are very excited about

In Memoriam

Robert E. Merriman, who was a volunteer at the Discovery Center for over a decade, passed away in June. Bob, or “Boss” as



his hat proclaimed, first volunteered for the school programs and later became a volunteer in the Exhibit Room. The staff enjoyed his book talks and his

humor and visitors enjoyed chatting with him about the estuary. Together, he and his wife Nancy were one of the first couples ever to try out the Reserve’s tandem kayak. Staff remember their laughter and friendly quarrels as they attempted to paddle together along the shoreline of Great Bay.

Bob was also a Marine Docent for many years and a member of the Chantey Singers. He was active in the Day at the Coast programs and helped out with classes and other Sea Grant programs.

We extend our sympathies to his family and many friends.

adding this new lesson to the program and tying it in with the methods of hunting and fishing of the Native Americans and also giving an opportunity to teach about sustainability. We hope that our experienced and new volunteers will be excited as well.

Sheila Roberge
Volunteer Coordinator,
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Fishermen on the Squamscott River in the late 1800s. Courtesy of the Stratham historical Society.