

Communicating Climate Change and the Oceans Summit

Summary of U.S. Aquarium Research

November 2008

Background and Objectives

In summer 2008 the Monterey Bay Aquarium engaged Edge Research to conduct background research in preparation for the *Communicating Climate Change and the Oceans Summit* in December.

The purpose of the research was to canvass Summit invitees to gain a better understanding of what actions these institutions are planning or undertaking to address climate change and the oceans at their institutions. The research questions included:

- Where is addressing climate change in the list of priorities for each institution?
- What barriers exist to developing and implementing climate-related exhibits and programs?
- What are invitees currently doing to communicate about climate change and the oceans?
- What are invitees planning to do? What exciting and creative approaches are being developed?
- Finally, what would participants like to get out of the meeting? What topics, speakers and working sessions would be most valuable?

Interviews were conducted with 15 executive directors and other leadership (vice-president level) staff at the following aquariums and science education institutions:

1. Aquarium of the Bay
2. Birch Aquarium at Scripps
3. Cabrillo Marine Aquarium
4. California Science Center
5. John G Shedd Aquarium
6. Mote Marine Aquarium
7. Mystic Aquarium
8. North Carolina Aquarium at Pine Knoll Shores
9. California Academy of Sciences
10. Tennessee Aquarium
11. Texas State Aquarium
12. Virginia Aquarium and Marine Science Center
13. North Carolina Aquarium at Fort Fisher
14. South Carolina Aquarium
15. National Aquarium in Baltimore

NOTE TO THE READER: Throughout this report, verbatim comments from the respondents are shown in offset italics. Due to the small and self-selected nature of the respondent pool, this research must be considered in a qualitative frame of reference. These results are not statistically projectable and may or may not be representative of the universe of U.S. aquarium directors and leadership staff.

Key Findings

Views of Climate Change

The prevailing point of view is that while climate change is real and happening and represents a significant threat to the ocean, marine and freshwater ecosystems; it is one of a number of urgent threats that must be addressed.

What trumps it in our area, I think, is the more general question of water quality with all the wonderful estuaries that we have [here] and the pressures put on them by development.

It is a pressure and we need to address carbon emissions which would help the oceans and the planet, but there are other things we can do to more directly and immediately alleviate negative impacts on ocean health.

It really is an all encompassing issues that we are trying to get across to our public, but we have some front burner things that are happening right now for us.

At the same time though, the importance barometer is rising on this issue:

Maybe eight years ago when the aquarium first opened, I really wouldn't have probably ranked it as one of the most important topics to deal with. However, as I've kind of come along and I've read more in the scientific literature, I'm convinced that it affects so many other things that it is really a very important issue to deal with.

The impacts of climate change about which aquarium leaders and senior staff are most concerned are sea level rise, ocean temperature change and ocean acidification with impacts to coral reefs as the canary in the coal mine for overall ocean health.

In our aquarium, we are very much focused on [specific region.] For our region, sea level rise is the most immediate impact and something we would like to address in terms of how this change could set off all these other changes in our ecosystem.

I think the sea level change part is an interesting one; it's the kind of thing that would work its way into a multifaceted education program.

Changes in ocean temperature and acidification, these are areas to me where you could educate on the science behind how do we measure these things and also what do they mean? What chain reactions will these changes set off? What will it mean for coral, for the food chain?

The general sense among most is that their senior leadership and science staff are knowledgeable and concerned about climate change. However, some say there is a spectrum of views at their institution and their leadership is not as concerned as they themselves are.

I feel like I know a lot about this issue, the leadership of my aquarium is concerned.

To me it is a big, big issue...I don't think my perspective necessarily has translated to all our staff and certainly not to our public either.

I don't feel that this issue is accepted at the top, it is not a priority at this time, but I am hoping that will change.

Almost all say that the public is much less knowledgeable and engaged on this topic, although a few feel the trend is changing to becoming more open to, curious and concerned about climate change.

I feel like there are huge disconnects in the way that climate change has been conveyed both in the popular media and by scientists, really that there are some serious misunderstandings among the public about this topic.

What also became apparent is people realized that climate change is real, that debate was over.

We were really expecting more push back, more angry letters [about exhibit]. We've had some but not what we thought could happen. People have been curious and interested.

Addressing Climate Change for the Public/Visitors

Nearly all aquariums interviewed are actively considering or grappling with the development of exhibits, public programming or other communications on climate change. Developing an integrated plan for educating visitors about climate change is strongly desired by nearly all respondents. Only a few of the 15 interviewed are explicitly not engaged at a senior leadership level on how to address this issue for the public.

The decision to actively address climate change impacts both in terms of operations and in the visitor experience comes from the top leadership of the aquarium becoming engaged on this issue.

The leadership is very concerned about climate change... and also hopeful to be able to start including a lot more in exhibit very, very soon. We've got some plans and some ideas to hopefully help address some of the issues we see with climate change communication, and we're going to start putting that in effect in early 2009.

We feel strongly as an institution that we have to address climate change as soon as possible.

Two other factors strongly influence whether and how much an aquarium feels it can take on this issue:

- Location and composition of visitorship: There are some regional differences how receptive aquarium visitors are perceived to be on the issue of climate change and this has some impact in whether and how aggressively the aquarium feels it can

address climate change in exhibits and programming. Not surprisingly, aquariums on the West Coast feel they have more latitude to address the issue than aquariums in the South and Gulf regions.

We have always tried to maintain what we think is hopefully a pretty good balance between being good stewards of the environment but also understanding the impact of industry and that there is a need to develop oil and gas resources and hopefully there is a way to do that that is ecologically sensitive. (Gulf region)

- Attitudes of major donors and sponsors: Some aquariums feel constrained by either the attitudes of major donors or the nature of the corporate sponsors. These are very important relationships to the survival and continued well-being of the institution and in some cases, there is resistance to climate change as being real and man-made or there are conflicts between sponsors and proposals to address climate change. For these aquariums to address climate change aggressively will first require an effort to engage these donors and sponsors in dialogue and come to some consensus on the aquarium's role and voice on this issue.

Our board tends to be much more on the conservative side of calling climate change or global warming by those names. They are finally beginning to acknowledge it because our governor [has taken some initiatives] and it is more acceptable in this state now. (Gulf region)

With the issue of climate change becoming more and more prevalent, this is honestly something we have not tackled yet. We are trying to explore and understand how we approach that subject...and I have already visited with several of our major donors to try to get a sense of what their company position is that can be consistent with our mission. (Gulf region)

A number of aquariums have begun to address climate change in public programming, most often in lecture series that include a focus on or discussion of the topic. Generally this includes an explanation of the causes, the potential impacts on ocean or marine environments, the local environment and discussion about what individuals can do to reduce greenhouse gas emissions.

To a lesser extent, some aquariums are including information about climate change at their websites or in articles in newsletters or other materials that go out to aquarium members. One institution has a climate change blog. As well, some are working on integrating climate change into the materials they have developed for K-12 education, although mostly aimed at 5th grade and higher.

Two aquariums have directly talked with visitors about climate change. In informal surveys with visitors, the South Carolina Aquarium found that people still perceive that there is debate and disagreement in the scientific community about the reality of climate change. Those who were concerned had a hard time bringing the problem down to a personal level - understanding what it means for their local area and what they can do to make a difference:

The thought is that it's not a local problem, that climate change is polar bears, that this was going to affect polar creatures, not sea turtles; that it wasn't something

that was a big concern for us locally, despite all evidence to the contrary. The sea here has already risen a foot, so our drainage system doesn't really work in the city anymore because it was designed as a foot lower sea level than it is now, and that's in the past 100 years. It really hasn't hit home that this is a local problem, and I think that's one of our challenges, just here in this community at least, is to make it a local problem and to personalize it. The other thing I would say is that those people who really are concerned about it have no idea what to do about it. When I asked what some effects of climate change might be, higher gas prices was the leading answer...People don't believe that they can have an impact on climate change, because they feel it's a government issue, that it's going to have to be dealt with my government.

Birch Aquarium at Scripps has done some evaluation work on their exhibit with visitors and can provide additional insight to those who are interested (however we did not cover the specific feedback during the interview).

At this point, few respondents (or their institutions) are being called on by media or others for comment on climate change. This is not necessarily an issue the aquariums see themselves as "experts" on, unlike the issues where they are actively doing research or working in the field. That said, they would like to play a role in helping their cities and regions understand and grapple with the issue and how to respond.

We would like to engage with the city in how to plan for climate change - we are an important and respected institution and that is a role we could play.

Because of our proximity to [the capital] we think we can play an important convening role on this issue.

Current Exhibits and Programs

Some institutions have recently developed new exhibits that address climate change.

The California Academy of Sciences:

- LEED certified green building interpreted by a wide range of signage, personal interaction and media (interpretive signs, programming provided by staff or docents, cell phone tours and podcasts, materials on the website, etc);
- The California and Climate Change exhibit (called "Altered State") highlights four global issues - changing oceans, places that are getting hotter and dryer or wetter, melting polar ice caps and species extinction—to show how the world is changing and California is changing;
- Their future plan is to have a flexible and changeable exhibit with some fixed elements and some changing;
- "Arena for Engagement" component addresses what people can do to get involved;

- Interactive components involving using body movements and shadows to move ice floes and reflect sun off of the polar caps and save the baby polar bear;
- “Carbon Café” component allows people look at meals and how their choice of foods has an impact on climate change.
- “Carbon Balance” shows how personal lifestyle can impact carbon footprint and climate change.

Birch Aquarium at Scripps:

- Designed to meet three overarching principles --
 - Explain the science-based case for human-induced global warming;
 - Be interactive and engaging, not a lecture;
 - Leave people feeling that there was something they could do to have a positive impact;
- Explains how scientists track temperature, how the CO2 we are measuring is unique and the sources are man-made not natural
- Explains the role of the ocean in global temperature and how the ocean is the frontline for climate change impacts;
- Interactive component allows people to be a reporter on a newscast reporting a story from the future about global warming.

While not a permanent exhibit, The Aquarium of the Bay developed a temporary installation and public program on sea level rise:

- Aquarium foundation in partnership with Office of the Environment in San Francisco and the Sierra Club created a website on climate change called www.FutureSeaLevel.org .
- Art installation allowing organizations, institutions, businesses, etc can tape their building to the level predicted sea level rise to raise public awareness;
- Taped the Aquarium and had a press conference; got approval from the city to tape all the libraries;
- Seeing the buildings taped drives people to the website where they can learn about climate change, use the carbon calculator, etc;
- Teachers responded very positively and the site is being re-scoped and re-launched for Bay area teachers. There is a plan for workshops and school tapings;
- The site is available for others to use and replicate the project in their own areas.

Other institutions have begun the process of developing new projects that will include climate change education components. Some examples are:

North Carolina Aquarium:

- Building three 1,000-foot long LEED certified concrete fishing piers that will have exhibits, classrooms, and a conservation theme;
- Wind energy to provide probably 90% of their electrical needs, and solar will make up the other 10%;
- Use of different sustainable technologies – geothermal, water reuse systems, cisterns;
- Interpretation through graphic panels on geothermal heating and cooling, rain cisterns water treatment, pervious pavers, etc.;
- Graphics and exhibits;
- University research - currently they have sea level rise instrumentation on existing dock which will be mounted on the new pier and interpretation provided;
- Opportunity to talk about hurricanes and storms, coastal erosion, fragile nature of barrier islands, as well as the fish and the birds and the ecosystem;
- Teaching sustainable fishing practices, recreational catch and release, etc.

Aquarium of the Bay:

- Went down the road of trying to create a climate change exhibit and rejected all the concepts;
- They were able to secure a PG&E sponsorship to do something on sustainable energy -- utility company as partner in promoting a complementary message;
- Decided to go back to their live animal focus and are bringing in jellies and octos and converting a touch tool area to a “Bay Lab” that will hold different aquatic species from around the bay and showcase each species’ story as it relates to climate change:
 - Jellies populations out of control because of warm waters;
 - Octos are migrating north because of the water temperatures;
 - The Bay Lab (holding bay area aquatic species) will be run by solar power and will have opportunity to talk about other alternative energy

South Carolina Aquarium:

- Strategy plays on local market and influence, with goal of making climate change personal and showing people effects on South Carolina and them;

- Use iconic people and animals here in South Carolina such as sea turtles and how sea level rises affects their nesting beaches. Also looking at impacts to fishermen, farmers, downtown Charleston;
- Creating opportunity around a temporary penguin exhibit.

Challenges to Communicating Climate Change the Oceans

Regardless of whether institutions had launched programs or were in the earliest planning stages, similar concerns and challenges were raised about how to tackle climate change as part of the visitor experience. They were:

- Maintaining the balance of education and entertainment that is critical to a successful aquarium for generating attachment and repeat visits;
- Connect to live animal exhibits, which is the bread and butter of what Aquariums do and the draw for the public;
- Not being perceived as too political or taking sides in a political debate. Many wondered about the best way to neutralize the politics and present the facts in a way that allows visitors draw science-based conclusions;
- Making it locally/regionally relevant. This is a global issue but most aquariums have a regional ecosystem focus. They want to be able to show what this issue means closer to home.
- Be inspiring and not demoralizing;
- How integrate climate change and its implications into existing exhibits and interpretive materials?
- Think beyond exhibits to other ways to education on climate change;
- How to train and use staff and docent interactions to help explain climate change and how it relates to what people are seeing at the aquarium;
- Avoid reinventing the wheel - if there are successful approaches out there, they want to implement those rather than start from scratch.

Just like anything else, we have to find a way to move your heart, so it is about content, but also the emotional attachment we can generate.

I think it would be helpful to have, if it could be done in a simplistic way, to talk about causes and then effects. There's a lot there to be discussed, and exactly how that information is presented is a very sensitive topic because there are still people who would shy away from saying that man's influence is causing this incredible and dramatic climate change. I think as long as the information is presented accurately with a lot of scientific basis to show that yes, there are natural cycles, and to also

show that yes, man's production of carbon dioxide is having an impact – if that can be presented in an effective way to show that it's really both, then that's an important one.

Overlay this and weave this message of sustainability and/or climate change into some of our messaging but not detract away from the beauty of many of the living exhibits in particular. Obviously what you want people to do is first begin thinking of how wonderful these habitats and these animals are and then you want to gently alert them to the fact that there are some very real problems.

Get visitors to say, 'Yes, it's in trouble, what can I do?' ...Not demoralize them and send them away thinking, 'What am I going to do? The world is going to end.' But send them away there is something you can do and there are ways to get involved. Just be a little more aggressive with the scale of the problem because it is an urgent problem. It's not something that we can wait five or ten years to solve. The longer we leave it the worse it gets.

Sometimes as institutions I think we get hung up on here's something important, we'd better do an exhibit about it, and I would say that that's unlikely in our case. It's much more likely to work its way into the type of informal education that we do in a salt marsh or on a boat or in a kayak or maybe even standing in our auditorium with a presentation, a slide show or something. It's much more likely to happen there than it is to happen at, say, an exhibit on climate change. For one thing, we're tight on exhibit space anyway. We tend to focus all of our exhibit space that we can on live animals, and that's always going to be a higher priority for us, because we do recognize sort of the entertainment value of what we do.

Addressing the Carbon Footprint of Operations

Although they may be wrestling with how to best to educate the public about climate change, most aquariums are actively engaged in reducing their own institutional carbon footprint. This takes numerous forms, but typically it is part of an overall sustainability or greening initiative.

Many institutions have created a "Green Team" to analyze the current operations, develop recommendations for how to reduce environmental impact and implement new systems and behaviors across the staff. The main motivation behind these initiatives extends beyond concerns about global warming and is motivated by a need to reduce energy consumption, operate more efficiently and cut costs. Typical changes or initiative include:

- Implementing (or planning to implement) some solar energy use at the Aquarium;
- Systems to increase efficient use of water including energy use for heating or cooling tanks;
- Lights off/motion sensor technologies or lights off policies;
- Commuter programs and employee incentives for carpool and public transportation;
- Staff training and seminars on sustainability issues;
- Plans for LEED certification for new building projects;
- Designing and implementing green roofs;

- When major permanent exhibits are being upgraded to include re-designs to be more energy, water and resource efficient.

Some but not all aquariums highlight and interpret these sustainability changes for their visitors. Those who do not publicize their sustainability practices plan to in the future, but have other competing priorities to address first.