

# GLOBAL CORAL REEF ALLIANCE

A non-profit organization for protection and sustainable management of coral reefs

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## **BAKERS BAY DEVELOPMENT SHOULD BE STOPPED IMMEDIATELY BEFORE IT KILLS GUANA CAY REEFS AND FISHERIES**

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The massive destruction of mangrove forests in northwestern Guana Cay, Abacos, by the Bakers Bay Development Scheme ("Passerine at Abaco Resort Community Development") to create a huge marina and golf course in mangroves and low lying forest areas, and to nearly quadruple the number of houses on the island, should be stopped immediately before it destroys what is left of the coral reefs and fisheries of the region.

The Bahamas needs sound economic development that protects its environmental resources, but this is a classic case of the sort of developments that have been allowed to cause untold damage in the past and which should no longer be permitted, now that the cumulative damage is clearly visible, and will be made far worse by climate change in the near future. Much stronger environmental laws and oversight are urgently needed because the Bahamas has permitted developments whose environmental costs have neither been recognized nor compensated for, and the accelerating pressures of global climate change make continuation of such policies a fool's paradise of profiting today and ignoring all the consequences that will strike tomorrow.

Large areas of critical mangrove habitat on the site have already been bulldozed and burned in order to create space for a golf course, marina, and more than 400 houses plus hotel accommodations, in an area that was flooded by the last hurricane. These developments already have, or soon will, destroy critical nursery areas for many species of reef fish, conch, and lobster.

Of critical importance are the coral reefs, lying just offshore from the areas being destroyed for this development, which rank among some of the best left in the Bahamas, and which are critical for the livelihood of Guana Cay residents. These reefs are extremely vulnerable to any nutrients that will inevitably wash onto them from the adjacent fertilizers of the golf course and the inadequately treated sewage of the more than 400 houses and other residential units that will be constructed on this currently uninhabited site.

Coral reefs are the most nutrient-sensitive ecosystem on earth. They are adapted to clear, clean waters, and are overgrown and killed by weedy algae at lower nutrient levels than any other habitat. We now know that it takes only 0.014 parts per million of nitrogen and only 0.003 parts per million of phosphorus to turn healthy coral reefs into masses of algae devoid of all marine life except a couple of algae eating fish. My ecological assessment of the site indicates that the entire area is already close to this threshold even before the massive new fertilizer and sewage releases from this project begin.

My assessment of this site is based on personal observations of the algae and over 50 years of experience of studying the role of algae on coral reefs, and the impacts of nutrients on them. I watched the coral reefs of Jamaica and many other places around the world destroyed by algae overgrowth caused by nutrient buildup in coastal waters from fertilizers and inadequately treated sewage, studied the impacts of nutrients on algae growth. I wrote the review on the impacts of land-based sources of nutrients on coral reefs and fisheries, and how to control them, for the United Nations Expert Meeting on Waste Management in Small Island Developing Countries. In addition I also wrote the National Coral Reef Assessment and Management and Restoration Strategy for the Turks and Caicos Islands, the Bahamas' closest neighbour and the most similar country ecologically. Turks and Caicos is the only country in the world that forces all developers to recycle all their waste waters on their own property.

I dived at several coral reef sites near the Bakers Bay development on February 9 2007. It should be noted that this is the coldest and driest time of the year and therefore the corals are the least affected by bleaching, diseases, and algae overgrowth, in contrast to the earlier independent assessments made at warmer times of the year by Dr. Michael Risk and Dr. James Cervino. Nevertheless, my observations completely back their conclusions, and refute the claims of the environmental impact assessment made by the development's hired consultants, which irresponsibly downplay or ignore the impacts to the reefs and fisheries that the development would inevitably cause.

Although widely regarded as some of the best reefs remaining in the Bahamas, these reefs have clearly suffered from the cumulative impacts of accelerating stress from increasing nutrients over the last decade. Older photographs of these reefs taken by Erik Gauger show little or no algae, but at present there is about 2-3 times more bottom coverage by algae than live corals, even though these observations were made at the season of minimum algae abundance. The buildup of algae and bacterial slime will rapidly smother most of what is left once new nutrients are added. At present there are still large numbers of sand producing algae that build the beach, but as nutrients increase these will be overgrown and killed by weedy algae that produce no sand, so that their new supply of sand will vanish while the corals that protect the beach from waves die from algae and disease, as sea level rises, and while hurricanes greatly increase

in strength.

Especially worrisome is the high abundance of weedy algae species indicating high nutrient levels, especially Cyanobacteria (blue-green algae, but which here are predominantly slimy and reddish in color) overgrowing dead and dying corals, sea fans, and gorgonians. This problem will get far worse when the water warms and more nutrients are added. That this algae abundance is due to excessive buildup of nutrients from existing developments in the Abacos and not due to over-fishing is clear because the fishes are dominated by algae-eating surgeonfish and parrotfish, but they are unable to control the algae buildup from smothering and killing corals. Local fishermen who have known these reefs for decades say that the algae buildup has happened over the last 5-10 years. In addition the water on the leeward side of the island, where the Marina entrances will be located, is already chronically green, indicating high nutrients.

It is clear that a long term plan to identify and map all the nutrient sources to the coastal zone, and the use of modern methods to recycle all of the nutrients on land and prevent coastal pollution need to be used in the Bahamas. Most of the corals are already gone, and it is only a matter of time for the rest if the current path of development continues in which all the waste nutrients go into the ground and then into the sea. Instead new methods need to be used to recycle the nutrients on land and feed them to plants and forests that are clearly starved of nutrients. Several new and highly efficient methods to do just this will be presented on May 7 2007 at the Partnership of New Technologies for Small Island States at the United Nations Commission on Sustainable Development, which I am organizing and invite the Bahamas delegation to participate in.

It is therefore clear that nutrients are already excessive and must be reduced through improved sewage management and nutrient recycling, not only in Guana Cay, but also in the Marsh Harbour region, if these reefs are to survive in the long run. It is equally clear that any conversion of the site from natural mangrove and forest to marinas, golf courses, and houses will inevitably add huge new nutrient sources from fertilizers and sewage that will swamp the existing nutrient sources, and very rapidly kill the remaining reefs and fisheries within a few years. Not only should the Baker's Bay project be stopped, the developers should restore and mitigate the damage they have caused, and in my view they should be required to pay compensation to the people of Guana Cay for the destruction they are causing to local reefs and fisheries.

In addition to damage from algae there has clearly been a large amount of mortality several decades ago of the magnificent elkhorn and staghorn coral forests that my grandfather photographed in the Bahamas in the 1940s. Large dead elkhorn corals dominate the shallow water, and the amount of living ones are small, young, and less than one percent of what they were. Not a single live staghorn coral was found, although their dead broken skeletons are common on the bottom. These two species are the most important in protecting the shoreline

from erosion. There has clearly been a large amount of partial mortality of the large head and brain corals from coral bleaching caused by global warming, and much of this took place in 2005. However, one unusual feature of these reefs is the unusually high abundance of young corals of the uncommon species *Manicina areolata* or “rose coral”.

I have compiled long term satellite temperature records for the Bahamas, and the trends are clearly upwards, so severe bleaching events, like hurricanes, are bound to become more frequent and intense in the future. Given the fact that the Bahamas is the most vulnerable country in the Atlantic to global warming and global sea level rise, it is crucial that the Bahamas develop a strong leadership voice in international efforts to stop human-caused climate change. Given that it would be the first Atlantic country to be drowned, its silence at international climate change conferences has been astonishing, as if people would rather hide their head in the sand than face the facts confronting them and stand up for their own long term interests.

The Bahamas is now racing down the same unsustainable track which has destroyed the reefs of Florida, and where 50 mile long blooms of slime have smothered the reefs next to sewage outfalls, and where hiding the sewage underground by deep well injection of wastes has been claimed to be the “dilution solution to pollution”. It is not: the sewage has been held back for a few years underground but is now pouring out of the deeper rock layers into the sea, causing blooms of algae and bacterial slime that are now killing reefs from the offshore side. Tragically, the Florida developers and sewage injectors are now bringing their methods to the Bahamas, which is even more vulnerable. South Floridians have a whole continent they can move to when the rising seas drown South Florida, but Bahamians do not have this option and must protect what they have.

One could hardly imagine a worse site for such a development if we desire to preserve our coral reefs, mangroves, and fisheries. This project would only temporarily enrich a handful of speculators and their hired help at the price of severe long-term costs to the Bahamian environment and people, like the developments underway in Bimini and so many other places. It should be stopped immediately before it causes further harm. If allowed to continue this development will devastate the resources from which the people of Guana Cay live, for the benefit of foreign speculators who are unlikely to ever see the consequences of their irresponsible actions. It is typical of an outdated model of development that enriches large foreign investors with no real long-term concerns about the future of the Bahamas, and will provide mainly low paid jobs for Haitian immigrants. In sharp contrast, Guana Cay is a model for small-scale locally owned tourism, which creates a completely different ambience that more tourists prefer, causes far less environmental damage, and in the long run is more economically beneficial to the Bahamian economy.

I urge the Government of the Bahamas to promptly enact and enforce environmental laws to protect the Nation's natural resources before they are further destroyed or degraded, and in particular to immediately stop this damaging "development" scheme. It is astonishing that the Bahamas is one of the few countries in the world with no real laws to protect the environment, especially the coral reefs and mangroves that are so crucial to it. For years long-term divers in the Bahamas have been telling me how fast the reefs are disappearing. In fact the damage is now so extensive that even saving and strictly protecting ALL remaining habitat in good condition will not be enough. Large-scale restoration of damaged coral reefs and mangroves will be needed if the country is to maintain its shore protection from rising sea level, its fisheries, and its ecotourism value. A long term sustainable environmental policy that is enforced is the badly needed first step.

I have voluntarily looked at this site, with no payment for my time, because of the urgency of the issues involved in this particular project, which has achieved worldwide notoriety for its destructiveness, the incompetence of its environmental impact assessment with regard to marine impacts, the give-away of Bahamian Crown Lands to foreign developers, and the near unanimous opposition of local residents. I have dived longer and in more reefs all around the Caribbean, Pacific, Indian Ocean, and Southeast Asia than any other marine scientist in the world, and advise international agencies, governments, non-profit community groups and environmental conservation groups, hotels, and dive shops on protecting and restoring coral reefs all around the globe. My only personal consideration is the preservation and restoration of the coral reefs for future generations.