Thank you very much. Over the years we have met a lot of people from Chico. I would like to say good to see some of you again and it's one of our favorite field schools because we've been hosting several field schools since 1995 thereabouts in Antigua, mostly Canadian, but now Chico is becoming our shining star and we like to develop long-term relationships with Chico and it's good to see some of you again and hopefully led to some good fun in the dirt soon. [laughter] I'm going to tell you a little bit about what we actually do in Antigua with archaeology. I'm the only archaeologist on the island. It's about 12 miles by 15 miles across. It's about 82,000, 85,000 people, about the same as Chico I think, and it's an independent country. Like most of the Caribbean Islands they were once British Colonies, but we are independent. We are on our own and in a sense we are a growing nation and it's important that we get the right disciplines in place not just through academic purposes but to build linkages and future connections and introduce people to the area. The new islands are always, the new countries are always on the edge of, they are short of everything especially brains and experience.
So, without further ado most of my research is managed through my museum. This is my museum the Nelson's Dockyard Museum. It's the [inaudible] of a former British Naval Base from the [inaudible] Georgian Period about 1725 to 1850, 1890. This is my little research lab up here and some students working. What we have created is an environment where serious academics can come. We will share our resources, we will help you find a good rental car, we will put you up as long as you are willing to work with us and share the data. Over the years we have seen containers full of artifacts leave the Caribbean Islands and never, they disappear to the void. We never get any results, never any data, nothing happens, we don't know what's happening. So by stimulating research and guiding it and working along with serious academics we have learned so much more and we have developed good partnerships and this is what we are all about at the Nelson's Dockyard Museum. It's funded by the national parks and we have developed some very close relationships in the recent times.
We now work very closely with CUNY. I am actually affiliated slightly with CUNY. We have a few people at Calgary, where I studied; Lakehead University now Chico, and we have recently become part of the North Atlantic Biological Organization and we are not in the North Atlantic, but they have adopted us and we work professors from Virginia Tech and University of Montreal.
The Caribbean area to most people it's that first image I showed you, tropical beach, sand, lovely scenery, but from an academic perspective it's a massive cultural area. It's a series of [inaudible] that all connect from South, Central and North America. The Bahamas connect to the Greater Antilles. From Trinidad you're up into the Lesser Antilles and from [inaudible] it's close contact with the Yucatan, sorry, with Yucatan and Cuba. So archaeology for many, many years focused on migration. Who is going where and when and to cataloging and dating and trying to figure out just who, the movement of people after the Ice Age.
The islands where we live is Antigua-Barbuda, [inaudible], Dominica so this is the Lesser Antilles all essentially mountaintops coming up from the eastern edge of the Caribbean plate. It's a seismic zone, there's lots of earthquakes and most of these islands still have active volcanoes.
Antigua is unique from a pre-historic perspective because while every isle is different some islands are coral atolls with [inaudible] materials; others are volcanic that rise straight from the abyss and hence no marine resources except for ocean [inaudible]. Antigua is different because we have both volcanic, we have a lot of clay deposition in the middle, and we have beautiful limestones. All important different environments for subsistence strategies in pre-Columbia context.
The first people that we have managed to date goes back to about 3100 BC. I know for sure there are earlier sites, but a lot of the sites dip into the sea and we think sea level is coming up we're losing a lot of archaeological sites. Some of the earliest sites could be underwater. We're not quite sure about what's in the sea, but we know for sure what's on land and it dates to about 3100 BC. These are early sites strictly on the waterfront. They are coastal [inaudible]. They are small, scattered settlements mostly on the north and east coast of the island and we recognize them primarily through their unique stone tools.
We have a catalog of 120 of these early archaic sites so far and about another 60 ceramic age sites; we'll get to the ceramic age sites [inaudible]. The interesting thing is the archaic sites are not found south of Antigua between Trinidad and coming up the island chain. So these people I don't think were migrating out of South America, which doesn't make any sense because the ocean currents bring you naturally from [inaudible] South America up into the island. So we think these people migrated the other way from mid-America down at a very early age, but again, that's an area very few archaeologists want to study this time period because it's not glamorous enough. Oh, you look at stone tools so unless you have a real strong liking for stone tools you don't find all the beautiful exotics. There's no jadeite and there's no beautiful pots to show off. So, we all tend to shy away and go for the pretty stuff, the good stuff. So this period gets seriously ignored except by the hard-core stone tool specialists.
Anyway so what we are doing with this archaic, again, here's a sample of the retouched blades. They never made points so we don't have the arrow heads that you have. They use tropical hardwood, but we do see some retouching on some very specialized tools.
Typical archaic site close to the sea slightly sheltered. All of this debris here would be broken tools, but just scrap away the surface it will be the solid mass of shell, of shells. It creates a bias that it’s only oysters and conch but once you get in there, there will be lots of remains and this is an off-shore island called Long Island Jumby Bay if you ever watched that show a couple of years ago, Lifestyles of the Rich and Famous, it featured this island a lot because that's where Robin Leach used to live and the entire island is made up of billions of cobbles of beautiful, perfect honey color and smoky black flint, flint nodules. So we are finding the archaic is people going to that island and harvesting flint from very early age from 5,000 years ago and the ceramic is people who came afterwards also went there to get the flint, but the ceramic age people took it with them through the entire Caribbean chain from Puerto Rico to Grenada. Most of these lots are built over so it's really hard getting samples now.
Again, archaic toolkit grinding stones, platforms, lots of bowls, but yet they have been categorized and labeled by my colleagues from up here as hunter/gatherers. There's nothing to hunt on this island. It only has iguanas and rodents. So, hunter/gatherer mindset I think goes out the window and so they changed it recently to fisher/foragers. I'd still like to throw that away. To me as much as you don't like the green stuff in life, you have to eat it, and I think these people were opposed to seeing something green, leafy green vegetables, but if you don't know what. We know in South America there were seeds in this time period like grass seeds. So we were not quite sure what they're posting but because no one really studies this time period that well we don't know for sure, but with the new research like we're doing now is we're going to be actually investigating a lot of these. Unfortunately for me and the museum my predecessor had a please touch policy. You could walk in the museum and pick up things. So there goes my chance of residue analysis. I'm going to get Kentucky Fried Chicken and everything else. So I'm going to have to get some stout tools from a sterile environment and hopefully get some luck there.
Now, this is my time period, my favorite period, along with everybody else, the second period we know around 5000 BC was the ceramic age. It's a blend of cultures of South American traditions and pottery styles. We talk about pottery as if they are people. That's the best way we can describe them. They come out of South America Orinoco River up into the islands and once you get to Grenada you can see the other island. From here you can see the other one. So you don't need to be a genius to navigate to the Caribbean Islands. You stand on the beaches there's another island in the distance. Getting there takes a lot of nerve because of the open ocean, but once you do that you're to another island. So we know they came from Orinoco River area and Arwak speaking people. The Caribbean is called the Caribbean, but it's named after the Caribs Indians, but I'll get to that stage later on, but as far as [inaudible] Caribs of the Caribbean so we have to work with the name change in the future, but that's another story but coming up through here you see the islands again they migrated fairly rapidly because the islands are so close and they got to Puerto Rico by about 200 AD and then for some reason they stopped and it's like a frontier between them and archaic aged people on this side of the frontier.
Now we call this saladoid because it's named after the site he came up with a system of classifying pottery and saladoid means the suffix added to the site of Saladero. So it's a saladoid, the [inaudible] Saladero site and he comes up with this style and we all go by it so we call it saladoid ceramics. It's a very sort of bizarre way of doing it but this pottery, this style is found in huge numbers at all sites. It's quite similar because the pottery of Antigua is so similar to the pottery in say Puerto Rico or [inaudible] or Trinidad. It's really hard. You can't tell the difference in inter-island styles. It's so identical. It's quite remarkable.
Some really unique samples, we sort of wonder what they were thinking at the time, but this actually makes sense for putting it into a fire. Big long [inaudible]. You have lots of hammock shipped vessels.
Again, you have here what we call zoning sites cross hatching. This is a style that goes right up in the highlands of Valdivia this hatching along with the Amazon or local traditions of white and red and lots of polychromes. So, again, very distinctive pottery.
For this kind of thing we can get secondary evidence. This was smoking cohoba. This is a drug and the shaman used to use this. It's like a it's a big hole. Some are beautifully ornate but this is a fairly simple one. We know this is spindle whorl for spinning cotton or making fibers, making thread. This edge gives us a style. These lines that end with dots. You see this as lot in some of the pottery styles and we call it the style. It's fairly diagnostic of the time of the time period when the traditions were in place and you can tell from this one here there's a huge, big flat disc for the griddle for cassava bread and for also what do they call it, burritos, big flat bread, but it's South American traditional bread, but this was made on a mat so we can get an idea of what the basketry, the weaving was like based on the imprint at the back of that because the baskets won't survive, nothing perishable survived, but that does.
Trade. We know that tropical forest culture they were involved in trade along the river networks and we see the same tradition being carried into the islands.
The Antiguan flint is being traded out and they're also using local rocks and minerals to make ornaments, beads like, for example, clear quartz crystals, crystals, petrified wood, raw malachite, all local minerals are being used to make beautiful pendants and ornaments and you find raw material in Antigua all stages of production so we know that they are making them there but we only find exotics being imported, things that don't belong to Antigua and come from there.
Samples of these you'll find amethysts, that's not Antiguan. Turquoise, that's not Antiguan. Malachite, that could be, but this is a barrel-shaped beads, quartz, clear quartz. We had one student who spent a whole summer trying to figure out how do you drill a clear quartz bead when all you have to work with is twigs and sticks and bits of flint. What do you have that's hard enough to drill into quartz? And when you find a burial like we did a young girl 72 beads perfectly shaped clear quartz beads, barrel shaped beads wrapped around her body. It's a serious grave offering and so I'm thinking, okay, yeah, that's pretty but how did you do that? How did you actually make that? You can see the [inaudible] drilling so she's been taking dental material to make plugs so she can study the drilling of the drill bits so you can change bits and change bits and experiment. She went through something like 24 feet of just to make a hole almost an eighth of an inch deep using sand and water, you know, it's incredible but anyway so we are finding these ornaments and interestingly we are finding, these are broken that have come off of jadeite axis.
Again more exotics.
Nephrite. That's not from the islands. More turquoise. Travertine. So what I did for my dissertation was I went and had a good look at what's on Antigua and looked at what my colleagues had found in other islands and did some sourcing work and I'm figuring out where do you get turquoise?
If someone has a source of turquoise anywhere in the Americas outside of the Southwestern United States and Mexico, please let me know, but turquoise we are finding it on beads on all of the islands, little tiny beads, and this dates to 200 AD. So, what does that say about long distance trade potential? Then my supervisor didn't take me too seriously and so we dropped it. We looked at the jadeite. Jadeite is unique. Every source of jade is different to the others.
You can fingerprint jade to its source because of the different minerals. Japanese jade is different than Chinese different than New Zealand different than Canadian and the jade we are finding on Antigua according to this big man here, Dr. George Harlow, the jadeite expert of the American Museum of Natural History. He's a specialist in sourcing materials and he says that Antiguan jade is similar to the Mayan, same as the Mayan jade and it comes from south of the Managua Falls in Guatemala and this is 200 AD. So that's, how did it get there?
The possible routes again straight up through here. I'm in favor of a southern route along the coast. Fishing people have contact. Arwak traders traded all along the coast. The evidence of it being here is early, early time period. Much earlier than evidence been here so I'm arguing for a route that comes that way but my Spanish colleagues are here desperately tried to prove we're the first so I'm going to win this argument but simply because of the chronology. It fits my theory; not theirs. But they're going to find a devious way to change that.
Again, what else are we finding? We're finding shell, a lot of shell. Shell is great for subsistence but it also makes a beautiful, hard tools as well as ornaments so we find a conch shell. Get a conch shell and break the lip off you can make it black in a pre-form and make all sorts of different axes. A conch shell axe is just as hard as a stone age if used the same way. You never bang into an object sideways. You sort of chip off big, long splinters and it's very effective. These are tiny ornaments, again, made from shell.
The sacred shell of both the Maya and the Inca was the thorny oyster, the spondylus americanus and the spondylus princeps. Antigua is the only island I have known, so far we are finding evidence of major caches of this material and they are using it to make all sorts of things.
Some beads, different colors and pendants, beautiful specimens.
Again, conch, beads made from the conch shell and if you really have a lot of free time, get some sand, get some stone and some sticks and make yourself a couple of beads because some of these beads are as small as three or four millimeters and they are drilled. They will fall through the screens if you're not really careful so how do you make stuff know that? To me it's absolutely mind boggling. My students often wonder why is he glazed over again. I'm thinking how did you make this? This is so small, tiny, but some of the things we are finding in the pumice we are finding beautiful like a big slab of volcanic pumice and a perfect straight groove in it. I'll show you one further on. I think [inaudible] a whole lot of blanks for us drill the holes and get blanks of similar size, put them in and make a long string and then go back and forth. You're making a whole lot together; something like a floppy pencil. You could grind, literally grind it away that way and reduce the whole thing. So you maybe work on a 100 at a time. That makes more sense to me than trying to polish each one individually. So, again, I'm sure there's somebody who has done this kind of a study so let me know if you come across anything like that.
A mask, this was found by a little boy and taken overseas, but beautiful art work. Again, dates about 200 to 400 AD.
So this is why we love this age is mostly archaic. You find these beautiful things that is quite, you know, satisfying.
So, again, we've got to figure out why the houses look like this. Where we dig meters squares we never find a house. We wonder what are we doing, everybody has found houses; we have never found houses in Antigua until the Dutch come along. Dutch archaeology is really bizarre because they will do; to them a unit is the size of an entire village. They scrap away all of the top soil until they get to where they can seem to primary context and then they start to do their work and to me it's like there's stuff in there you can't push that out there's stuff in there, but arguing over the logic it's going to be pushed away. They are arguing for the bigger picture and they map the entire site and then they decide where they're going to excavate and they're finding, they were the first ones to find structures and patterns because they are looking at a big landscape whereas I'm looking at a little telephone booth sized hole. So, and some of the poles we find that held up some of these houses when you measure them they are like 2 meters across.
So it's quite amazing the differences in technology. So what we did is we tried some connectivity and resistivity testing. I convinced a student to do that for his masters and the results were quite astonishing.
We did find patterns and so we said, okay, let’s test a few of these so we excavated where these hits were on the computer and we found our very first fossil and they're always V-shaped. One side is straight, comes up about half way and it angles back quite far. They probably jammed a big, huge log in and then tipped it up. It makes sense, but intact wood up to about here, charcoal, ash and then dirt. So it's quite interesting. And we also found post holes dug into solid rock. Beautifully polished smooth hole like a silo a meter around. How did you do that again? It’s quite fascinating, but you need to do that if you're in a hurricane zone.
Now what happened to all this beautiful stuff over time? By about 900 or 1000 AD things started to change and the change is so dramatic that suddenly they moved from this huge, big beautiful sediments, all of these beautiful ornaments to very, it's like suddenly everybody is in a hurry and it's broke up into very small little villages all in the waterfront. The long distance trade seems to disappear, no more exotics, everything is made locally now and the explanation has always been, well, the population has got so big they expanded and they could now trade with each other. I didn’t have to go to South America anymore, but I'm arguing there's something else happening here. Is it environment? What's happening? So I'm reading books like The Great Warming and the Ice Age and I'm thinking, okay, what, if it affected cultures elsewhere, what was happening in these islands? So I started developing an environmental approach but not being an environment archaeologist I specialize in British [inaudible] culture and saladoid pottery, I started asking my colleagues what do you see here? What's happening here? And getting that outside opinion has really opened my eyes a lot and suddenly we are looking at what's happening? There seems to be a dried period developing. We see a lot more cotton being grown and suddenly there's a lot of spindle whorl and we are seeing a huge change in diet.
They are still eating the same things that they did before but the diet has expanded tremendously to include everything that is literally not moving. We find here the pottery is same style but it's crude. Very simple, very crude. The same lines with dots and it's all brought in like everybody is in a hurry, here's a pot. Never mind the symbol, the symbolic painting it's just, hey, it's a pot. I need a pot, there's a pot. No more messages being carried in these beautiful paintings. Nobody to impress anymore.
So, what are we working on now?
We’re looking to see what were the changes, what stimulated the cultural changes? I’m finding natural disasters, hurricanes. Antigua whenever there is a volcano next door going off. Suddenly a mass of refugees appear on all shores. Whenever a hurricane comes, people move away but they go back home eventually. So the sites that I’m finding that are really shallow, massive sites in one time period. Are these potentially refugees coming in and out? Also I’m finding things like volcanic pumice that dates to this time period. So, is it volcanic activities? Are there inter-island, people moving in and out of the islands because of disasters? It’s a long shot but at least you’re thinking about something different. Always over exploitation of traditional resources. No one has really looked at environmental in the small islands before so the cultural change has always been seen as new people coming in, old people dying out, new ways, things change, but again, I think the environment has something to do with all of this.
Twenty miles away this is what happens fairly regularly is when it's on the island it gets bigger everyday literally. It's lots of beautiful archaeological sites been buried and what I'm finding is, for example, the site I've worked at, a site called Royals [phonetic] that dates to about 400 AD, I'm finding a lot of pumice, a lot of beads made out of sulfur, hard sulfur. So there is volcanic activity somewhere nearby. It's not in Antigua so where did these people come from and where are they bringing this stuff?
Here's pumice. Pumice floats by the way. It's a rock, but it floats. It's all these beautiful grooves. I mean if you want to polish your bead or something you find big slabs of it all different shapes, but it's beautiful as a standing block.
So we started looking a little further and said, okay, what's happening with the hurricanes? We're getting so many more hurricanes now. Were there differences in hurricane patterns back then? We're looking to see over the last 100 years all the main storms and these patterns emerge and say, oh, my God, you sort of wonder, you know, what happened back then, too? Was it the same as this? A lot of tropical storms and hurricanes and you could see the tracks and the paths that they take.
So environmental archaeology I'm thinking okay what's in the soils? What can I learn from it? I think the soil is it's zero, it's neutral to alkaline, it's excellent preservation organic. All the things it told me in the textbook never to look for in regular soil says, don't bother, it's tropical soils, the asset is gone.
A blind test I got my first batch of pollen and I got all sorts of other things I had no idea what any of them were because this not my background and I don’t have a comparative collection to work with but it’s opened up our eyes so we can focus now and say hey wait a minute, we can find pollen, so that’s some environmental reconstruction. Will you not know, sir? No. It’s takes the moisture, it takes minerals in the liquid state like say silica and it gets into the cells, the plant dies, it hardens, microscopic it’s a copy of the cell of that plant. So you can identify that and recognize what it is. You can see different grasses and palms and all the different types so it tells you what kind of plants were there. To use that technique you look at the pollen as well and you look at other things and look at the charcoal and you can develop a picture of what plants were on the island before.
So what happens, going through the history again so we can get to the good parts, Columbus arrived in 1493, '92 in the Bahamas, but we say '93 because he arrived in the Caribbean in '93. He come down the small islands there's no gold he has no interest, but after a month or two of bashing around at sea you have scurvy, you need to get fresh water, wood, food, they use the small islands as a pit stop to refresh himself before sailing on to Mexico. They didn't attempt to settle the small islands but they would raid them to capture the natives as slaves. They declared the natives of the southern islands where we live to be Caribs and based on Columbus's interpretation that he was talking to some, his first arrival in the Bahamas he was talking to some of the natives and they told him that there were islands to the east with Caribs, called Caribs. They were cannibals and they had one eye on their forehead. He seems to have forgotten the forehead part of it but goes on to say that there are islands to the east with Caribs and he came there and stopped off at Guadalupe, went to shore, went into a house and there were bones, human bones in a basket. So he took that to mean that that is lunch. These people are cannibals. So ever since then the Caribbean has been associated with cannibalism. We have done research there since the 1940s and have found no evidence of cannibalism. None. What we find is post-modern traditions. We are finding they kept bones of their ancestors, of powerful people around.
We are finding, we excavate a cemetery in Guadalupe and we find 15 individuals and this one has three arms and this one has one. I estimated a young female. She had two right arms, one bigger than the other and one left. It was the biggest mystery to me in my whole life, but she also had a huge big stork, a bird with her and I thought, okay, found a bird woman, but it's odd because something is happening that we can't understand so you excavate a whole cemetery and you begin to see patterns emerging where there's a redistribution of bones of the dead and some people obviously have been given bones of their ancestors with them as they go or, again, I don't fully understand it. The Dutch are doing, who are leading that part of the research from the University of Leiden, they are looking at DNA to try to figure out what is actually happening or why are these bones being shuffled around but imagine a European priest arrives and there's a basket of bones on the table he says, oh, he's either physical anthropologist or he's a cannibal. [laughter] So anyway so the British came to the islands right after the Spanish.
Again, the whole cannibalism thing, but the myth is pervasive even today and that is great because the Queen of Spain and the British Monarchy went along with it. You could legally enslave these people and take their lands and everything they own if they were Carib cannibals. So right away everybody began a Carib cannibal because the settlers wanted land and it's a small island, there's not a whole lot of land. So they are the first to be literally exterminated.
So, they settled the islands of Antigua and Synkets in 1620s and 30s and eventually the colonists tried to escape from Oliver Cromwell and all the things that were happening in England during the Civil War much like the colonists here in the United States. They were trying to get away from religious persecution and they're trying to find a new life and to get wealthy.
They did so through very horrible means, but the warfare with them and the surviving Indians continued well into the 1730s. A lot of fortifications were built in the very early days to keep the Indians out and the French who were always with them and we see that early period is almost avoided in archaeological record. Very little work is actually being done on that early, early days, those early periods because there's very little written accounts about the small islands so it's an archaeological void.
So initially these people started planting ironically, tobacco for export back to Britain, cotton, and they survived on Indian food.
Changing Economy

• When tobacco began to be grown in the new colonies in America, the European markets were quickly glutted and prices fell dramatically.
• Sugar was introduced to Barbados (from Brazil) by the Dutch, who developed a trading based economy throughout the region.

But when North America came on the scene and you guys started exporting tobacco on a big scale, the European’s market glutted and the islands began to suffer from the economic crisis. No one wanted the Caribbean tobacco so the Dutch started teaching them how to make rum and how to make sugar cane into sugar. The Dutch were the traders. They provided, they teach you to do something that we can profit from it, be the carriers.
So they made a fortune trading between the islands but with that sugar was introduced and with sugar comes slavery and a whole change in the social order. Large tracts of land were required so the islands were virtually deforested to set up plantations. Africans were brought in and all the small farmers were evicted. A lot of them turned to piracy, a lot of them moved to the east coast of the United States and they were displaced by the wealthy planters who could literally buy a huge tract of land and set up a production. They tried indentured workers. They brought in thousands and thousands of Irish to work in the fields, but they couldn't quite manage it and so they turned to Africa where they could get an endless supply of labor.
With sugar Europe suddenly got very wealthy. Imagine you turn on a whole continent to sugar. You could never get sugar or anything in your whole life except honey very rarely and suddenly there's affordable sweetener and you can get rum and you can get tobacco and so suddenly everything is just booming. The economy is taking off, the investments are going, ports like Liverpool, Bristol went from being small little villages to huge, big industrial towns supplying supplies to be traded in Africa.
Tobacco products were brought across and sold in the islands, rum and cotton and sugar shipped north and to Britain and so the trade route developed between Europe, Africa and the West Indies and North America and it became the currency of the day. You could not break that link.
It was just so strong, so powerful, the huge cartels behind all these planters and a lot of cities developed and the British, and the thing was they brought with them all of that way of life and tradition and so we look at in the archaeological record and it's quite interesting to see how the planters lived versus how the indentured Indians and the slave people lived and they kept all the traditions in the same clothing and their way of life because the Englishmen had to be an Englishman. You had to wear your red coat and your vest and your three layers of wool in the tropical heat all day long and so never mind, you know, so they invented things like the fainting coach. So get up and carry on, but it was interesting to see how that culture continued.
So the results of the sugar plantation systems the islands were completely deforested and more than 200 years of mono cropping happened after that where they planted the same thing in the same field over and over so soil depletion was something dramatic and they brought lots of new animals and plants in. It's interesting to see how that exchange how things went, you know, we all seem to take this for granted, but lots of the fruits and vegetables we take today, African and even in Europe they'll take things for granted that came from here so it's that whole exchange system developed out of this early stage of development. End results for archaeology.
Today we have 175 sugar estates surviving. Not all in pristine condition as Betty's hope for research but there's a whole lot of research still. This is by the way the Bolling House [phonetic] floor. We look at the stone work and the detailing. It could be in an English cathedral. The tiles were imported from the south of France. The slate on the roof of the mill was bought from Cornwall. So there's serious money been spent on factories. I think they put more money into the factory complex than they did in the great house.
So, what we are doing is we are looking at climate change research as well as part of our initiative today. We look to see how the islands changed because my job with the government is really going to change my focus in archaeology. I've been asked to sit in on several committees including a new land use plan for the island, zoning, we must include heritage sites, and where can we build, where shouldn't we build and [inaudible] his opinion because we have a different perspective. We have a long term, we can look back in time and we can do the research in time to see why shouldn't you not build on that beach here? Or what happened here before? Why is that village extinct? So we have a different perspective than most people so for us to advise them is quite an opportunity. So, I've developed a network that includes California but primarily from CUNY, I mean, ah, City University of New York system. We have essentially brought in Vikings to help. They work in primarily in Iceland and Greenland. Places where the environment has been seriously impacted and what do we have in common? We thought, well, we are all on islands. There's Manhattan, there's Antigua-Barbuda, and there's Iceland. All have been seriously impacted by humans. The first thing they did was chop down all the forest, the Vikings chopped down all the forests and burned all the wood, the charcoal to make iron works, they turned sheep loose all over the island and serious deforestation and serious environmental devastation. Manhattan. Antigua-Barbuda is deforested for sugar cane so what do we have in common? What can we learn from each other? There are serious environmental archaeologists and with their application in the north so we say let's try some of that in the south form an alliance and see where it leads. The results have been absolutely spectacular.
This is the team. People studying the birds. The Icelanders actually come to study the birds. I mean, for example, we have migratory birds coming south. To me it's just a duck, but to this guy he said, oh, this is a so and so, he's from the high Arctic and that one is from Norway or this one comes the Canadian Wild and to me it's just another duck. So by having a different perspective it really changes our thinking of what we are doing and we see the bigger picture. We have paleobotany. Lisa Kennedy, who is usually up to her neck in the mud digging samples, but she looks at hurricane deposition. I was thinking how can you figure out a hurricane deposition? There are a couple of people here on this list who does that. They are called paleotempestologists. Big word. What they do is they actually go through, first I thought it was a joke. I said you really do that? And they go to a wetland and take a core sample and then they look at things like [inaudible] and they say, okay, there's freshwater species and salt water species. Suddenly you're looking at the layers of mud you extracted that's like 10,000 years you've got freshwater here, you've got salt water there, so they can see the ponds and the swamps you're working in have gone this big intrusion of salt from the ocean or big sediment deposit. So they look at that and they can tell you well you had a storm event here or you had a volcanic event here, and you can see where the [inaudible] has changed or the species have changed or the sudden die off of vegetation that could be because of the salt and that's where those blind shrimp are coming from. They came in during that storm event. Again it opens the bigger picture to us as, to me anyway as [inaudible] to the whole environmental side. So that's been a tremendous benefit of working with this team. Again, the islands have changed.
We’ve got Manhattan, Iceland and Antigua. Far apart of the Atlantic but we have so much in common even the salt fish that has brought to the islands, the salted cod was shipped over from north and it’s a food they fed to the slaves and the soldiers. The rum was usually shipped to New York, which we see a lot of rum from the Caribbean and most of it is shipped off the island, but it was, again, we have these tenuous links that we just don't think about.
So the basic research strategy. More than just regular archaeology we look at, people are looking at the archives, there are people looking at the insects and we are also looking at the industry.
So deep core samples, we take a lot of deep core samples from the wetlands and, again, look at it, the sediment people. It's fairly expensive. The National Science Foundation sort of came to our rescue. It's been really wonderful experience. Phosphate analysis. This is something as an undergrad but never had a chance. We do mapping of all sites. We go across the landscape and we see, okay, here's a scatter, we map it with GPS, this is a site here not realizing that there's nothing at all on the surface there but phosphates will show us that wait a minute that's where the concentrations are. This little surface scatter is actually something that's been swept aside over the millennia and so we're looking at areas that we thought were sterile and that's where we're really finding the motherload of such and it's completely changing the picture of our landscapes because and also it's changing my vision because a lot of my sites are classified as being in that area where the GPS and visual remains, but now realizing that I'm given permission to build there but not here and that's where the real site is. So the potential application of these kind of techniques we just begin to take another look at for the future.
Beyond the CUNY image I have a regular life that involves traditional archaeology and it's looking at sites like plantation sites and there's a really good program and I would like to thank you guys because it's a lot of potential and I think we can expand it. We don't know yet, but it's going to grow. We're looking at museums and conservation as well. So a lot happening, but anyway other than that we have one of my colleagues, Tamara. She's from Thunder Bay, Ontario. She looks at human remains and we usually have at least one or two graduate students hanging around the island that I supervise and there's one looking at plantations as well.
For the plantation archaeology we also do experimental archaeology at one time. We actually rebuilt a windmill because no one has ever seen a windmill. People think that they are water towers or they are silos or they're all sorts of things, but there are actually windmills for crushing cane and so we rebuilt one and the University of [inaudible] were the first to actually run that windmill and this is [inaudible] one of the most popular tourism monuments on the island, but [inaudible] is a truly frightening experience building something we had no idea about collecting all these bits and parts and it's all cast iron. Everything weighs a ton. Actually when you put the sails on they come right down to here and it takes 13 revolutions for one turn of the roller inside. It's geared down aluminum the way and so it's quite frightening to see how that thing will actually whip around and it's turning so slowly inside and the technology is to me phenomenal because, again, we had no idea what we were doing, we were looking at old records and old drawings and this must go here and that must go there, but there's no way to stop and start this thing unless you turn the entire building, the top of it, into the wind so there's a long shaft that comes down here. You have to pull that into the wind and push it back out to stop it and start it. So we get a lot of grief why don't you run it every day?
The tourists want to see something, but we can't because to stop and start that thing it's dangerous. Cost a small fortune was built in 1690 so that was the break. We're also looking at the planters themselves. There is a site in the national park that is [inaudible] tobacco and we knew there were graves there so we had to relocate the gravestones so we wanted to see where not to put it because gravestones are huge, the size of this desk, big massive blocks and while we were clearing the area we found a grave shaft and there's Mr. Warner, he's the grandson of the first governor of the island, and very little is left of him, but his descendent came all the way from Australia and we had a long conversation about this and he's quite fascinated. He's given the family history so we can merge the archaeology with the family history. He was the first man I've ever met buried in an iron coffin. It's interesting. So do you keep the thing around? Where did you get iron coffin from in the early 1600s when they first settled the island? You must have carried your coffin with you. Where do you get an iron coffin from at a colony in the Caribbean?
So back to Betty's Hope. Betty's Hope is great because we're looking at it has what's called papers. The family in England, lived in England, and they communicated with their attorneys and managers who ran the estate. It's a lot of documents going back and fro. That was all kept by the families in the archives and so we have like 200 or 300 years of documented, of archived research into sort of support or we can work with for the archaeology. We're having some issues though with the national archives giving access to this, but we've procured our own copy, and so we're going to be, so a lot of fun coming soon with that one because it gives us access to the documents that we can actually handle. You can't handle the original papers. They're just too fragile, but you can actually go through these microfilms and really pick it apart and see what's there.
Again, Chico students.
This was in Chris's year.
Another, we sort of came to the aid of the United States Air Force. There's an Air Force base there and they were doing some work and on it was a burial site. So we thought it would be one grave. It turns out there were 11, an entire family, and so we exhumed all the bodies, we're doing the study and we're going to reinter them at a site that's protected within national parks. We sort of collect, sites get destroyed by residential development, we collect tombstones and human remains for reinternment in a protected area, but this is a family. We learned a lot about this family, but that's not published yet so I am going to leave that for the physical anthropologist. Again, it's the first time I've ever seen someone buried with their name right on the coffin and it is done in brass text and the copper and it's because of that it survived and the fabric around it and the wood is nailed into survived so there's Jeremiah Nibbs [phonetic] and the date he died, born and died, perfectly preserved [inaudible]. Unfortunately for Mr. Nibbs, it's like a horror movie as we cleaned away there was a termite nest in his head so. [laughter] They came pouring out as we started digging so it was literally a scene that you don't want to see too much. [laughter] It's really creepy.
This is where I work. My office is actually in the middle of this island. It's now a modern day marina and we raise enough revenue there to support efforts like what we do. It was the British Naval Base and hurricane shelter once in the Caribbean. The place where they refitted their ships before making the Atlantic crossing. When North America became, except for Canada, when it became a foreign company, the British needed a base where they could fix their ships up after battles and after patrolling the Caribbean Sea so Antigua was the last port before they reached Bermuda for the Atlantic crossing so it was a fairly important naval establishment. There are 15 fortifications surrounding this dockyard and we did all the water archaeology in here several years running, but it's good and bad. It's bad we have no conservation unit so mostly everything had to go back into the sea, but it gave us some good insights into the potential and that's what we're going to be working on in the future. That's our goal, that's where we are heading to instead of a small lab so we can actually do some underwater archaeology.
When we built the sea wall back in 2003, it was my job to monitor the change and as they're pulling out the old blocks, there's intact old wooden wall that goes back to the 1730s still there wrapped in copper and covered in tar. So I had to go and photograph it. It was the scariest thing I've ever done diving underneath these barges shifting big blocks of concrete over my head because they're not going to stop, but it was nice to get some photographs and to see what's happening under the water there.
We also recovered a name the object for killing a human being we found it. We found bombs, we found mortar shells, but they occupied this up until during the Second World War the local regiments, the regiments used it for training so they tossed all the old ammo and everything overboard. They tossed all their spent ammunition. We found every size of cannonball possible, every type of barrel shot, chain shot, we found bullets going back to the, every type of cartridge from Henry Rifle cartridges, 303's you name them. We recovered them all both live as well as duds and spent ones, but we did a series of underwater archaeology. This is done by students who volunteered who were trained divers and occasionally you find one or two scuba diver geeks in every batch and so that went quite well. Lots of beautiful artifacts.
These are the ones we kept.
These are the pulleys from the old sailing ships.
China, from the different mess, each ship has a mess number, british unit.
Again, British military archaeology.
After a while the British started running out, literally running out of soldiers because 51% never made it back. They died of yellow fever or malaria and what we find in our latest research is we took some bone samples and we find there is a lot of lead in the bones of the sailors because each man got almost a pint of rum a day which he had to drink before noon. [laughter] We heard that 30% death alcohol related accidents and now we know why, but the lead is off the scale in lots of the British soldiers and sailors so we are now beginning that research to see what is happening and were the British sailors actually dying from lead poisoning as well.
You see tombstones marked died from the withering effects of the tropics and people don't wither that I have noticed. So, we think a lot of them are poisoning from lead.
Fairly common artifacts. The Hessians were there, the guys from Sleepy Hollow, the Germany mercenaries.
The tombstones that described people dying from dysentery and withering away.
Recovery on this beach after hurricane event took out a section of this beach we realized it's a British cemetery. The ships were anchored along here and they buried their dead literally on the sand of this now hotel. So all these bones are there just right beneath the surface in the sand; as shallow as 12 inches, as deep as six feet.
Okay. So that's it then. Well, thank you. [Applause]