Oral History 7: Chuck Mitchell, Recorded by Paul Dayton and Ashleigh Palinkas, 6 May 2014

Paul: Ashleigh asked me for help with her thesis on recreational diving. We got into the science and talked to Dave Leighton about three weeks too late, and Chuck [Nicklin]. She then talked to Dick Long to get some idea of the evolution of diving gear. It has actually grown from our two little focused things. You grew up here as I recall and you interfaced with recreational divers and scientists at an early stage. To me you are the most valuable one we have. She has to turn in her thesis at the end of this month. To me, that means nothing. It just satisfies three ladies over in another building. The real thing is what we take to these museums. We don't have a deadline on that. I think we're both thinking about continuing. It's really interesting.

Ashleigh: And really fun. This recorder is good. It picks up a lot too.

Paul: She has been doing it independently. We got to where she has been doing it. But why don’t we start off with a question, just so that you have a question answered on the tape. Chuck, you want to tell us where you were born? How you grew up, where you grew up?

Chuck: I was actually born in Los Angeles, Los Angeles General Hospital. I moved here to San Diego in 1947. I think I was in the first or second grade as I recall. But I grew up in Point Loma, went to Cabrillo Elementary School, Dana Junior High and Point Loma High School. My father was a mechanic, he always kind of owned his own garages so I spend a lot of time working on cars and figuring out how things work. That is a driving force in my life, I want to know how things work. And I think that’s a driving subject all the way through my life so far. It has not quit. One of the things that is kind of interesting growing up in point Loma-- Point Loma in the 50s, it was called locally, it was referred to as the tuna mill. It was mostly tuna fisherman. We lived in apartments and houses for maybe three or four years there when we first moved to San Diego, and then we spent so much time on the water and on our boat that we ended up moving onto a boat. Except for 2 1/2 years or so, I lived on a boat. Where what today is Shelter Island. That was probably ‘50 to ‘52, something like that. I wasn’t in LA then. It would be just after the War. We lived on a boat. At Jim Underwood's Landing. I think it was still there, the first Marina on Shelter Island. The Kona Kai I think was next, and then whatever was originally called Christians Flight, or something like that, on the other end of the island. The streets were dirt originally. And that is when I really started to play around on boats, skiffs, that kind of thing.

Paul: How old were you in fifty-two?

Chuck: I was twelve. I was born in December 1940. And I had a fleet of small boats because I had a deal going with the harbormaster that if I found a boat floating, a skiff or something like that, I'd turn it over to him and then he would keep it for thirty days and if nobody claimed it, I got it.

Ashleigh: Nice gig!

Chuck: Oh yeah. I had a lot of little junk boats. Anyway, then I started working at age eleven on the sport fishing boats. I got a work permit and I would work on the sport fishing boats, when they came in at the end of the day I would clean the galleys, wash all the dishes and make all the bunks.

Paul: Did you go out fishing with them as well?

Chuck: Yeah, I would go out as well and work my way up. They were just day boats.

Paul: Do you remember what they were catching?

Chuck: Yeah. What do you mean?

Paul: What kind of fish, how big were they? We are interested in the baseline.

Chuck: Oh, then you will have to go to my database that I put together.

Paul: We will have to get that, is that the one that you did from the LA Times?

Chuck: Yes.

Paul: Do you have a copy of that?

Chuck: I do not.

Ashleigh: Do you know where we could get a copy of that?

Paul: John Hunter lost it, I think. I don't know, I haven't been able to find it.

Chuck: Well it was online, it was in the NOAA database for quite a while.

Paul: We tried to get that once.

Ashleigh: I can look it up, I'm good at digging.

Chuck: If you're interested in that, there is a paper that I and Bob—I want to say Cowan—he was a student here.

Paul: Really? He was one of my students. I didn't know he worked on that.

Chuck: Well no, he didn't work on that. But because he and I had met prior, when he left here he came to work at MBC for a while. And he and I wrote a paper on sportfishing—what's it called? Sportfishing revitalization in Santa Monica Bay or something like that. It was for the Department of Fish and Game. They asked if we would take a look at that. And I can give you a copy of that. And what you want to look at is that, we looked at two-- what we called "similar areas". Santa Monica Bay, because that was what they were interested in revitalizing, and we looked at La Jolla. Both of them sportfishing areas with a submarine canyon, shallow embayment, and thought that it might make a nice comparison to see how they track one other. Santa Monica Bay being off-limits to commercial fishing since 1938, I think it was. So you should see the effects of sport fishing, etc. And we went back and got the catch statistics, Fish and Game catch logs and looked at those from 1928 to the present at that time. And one of the things that immediately stunned me was, the catch per unit effort was not statistically significant. I was thinking, that doesn't make any sense because I remember this and it was not like that. But when we started to break down the catches, what we caught by decade, we broke it down and you could see the change in what people were bringing home. The stuff in the '50s that we would have just thrown back over the side like mackerel and lizard fish and stuff, it suddenly became the catch, so you can just see the degradation and the quality, if you will, of the fishery. It changed considerably.

Paul: Can you get us that paper with Bob? I'd really like that.

Chuck: Yes. We have reprint file and we've got a gazillion of them now. I will tell you right now, there is a "problem" with it, in quotes. What happened was that we turned it into Fish and Game, and Fish and Game was amazed and said we had to get progress reports. They would say, "Gosh, this is incredible! Where did you get this data?" And we would say, "It's your data, we just looked at it." Right? Not just collected it, we actually looked at it. And they were amazed. And then, when the time came that we had to make recommendations on revitalization, they did not like the recommendations. Because what they wanted, they wanted more launching ramps, and they wanted more slips for marinas and stuff so more people, more artificial reefs in the bay, and I said, "Hold it! It is at its absolute maximum carrying capacity now! Look at the statistics, look at the fisheries!"

Paul: And what year was that roughly?

Chuck: This must be ninety-five, ninety-two, something like that? Early 90s. It might have been a little earlier than that. Anyway, they got very irritated. And they wanted to see those recommendations, so we argued about it for several weeks. In person and over the phone.

Paul: Do you remember who you were arguing with? It wasn't Fletcher, was it?

Chuck: No, Bob Fletcher-- we argued later.
[Laughter]
I can't remember a thing right now.

Paul: Radovitch?

Chuck: No. Radovitch had been long gone and, gosh—who was after?

Paul: It might come to you later. I would be interested in that. They were very sensitive to that stuff that Ed [Parnell] did and they actually bullied Ed into withdrawing a paper.

Chuck: What happened in our case is that, I said well I'm not going to do it, period. But this is our contract, here is our report, and if you want to put those in there then you know, rip the cover off it because I don't want my name on it. Just do what you want with it. And what happened was, they backed off. The compromise was that they would write the recommendations, okay? So their name was on the recommendations. They are authors of the recommendations. So it went out, and it went public in probably a month. Then I started getting phone calls from people like Paul saying, "God, this is a great piece of work, but I don't understand, how did you get to this?" I'd say, " Well, you have to look and see who wrote the recommendation," And they'd say, "Oh, okay, I see."

Paul: This is the type of story I really originally wanted. But first, let's go back and get your diving and maybe get up into some more of these. Because I'm trying to get out of these things—and we've sort of got it, but it's pretty hard to pull—but the shift in the fishing, of what's available over time. Just these huge fish-- well now they're starting to come back so you can't say that they're gone, but they did disappear for a while.

Chuck: Yes, they did.

Paul: But why don't you go back and think about your first dive? Why don't we follow our little guideline for topics.

Chuck: Well, I grew up on the water. And I was working on these sport boats, and I have been listening to all of these stories from fisherman.

About what fish do, and I've always wondered about this. Fisherman would hook up a fish and—I'm just making one example here, but—they'd say, it must be a big yellowtail and you have to keep them out of the caves. Or the sheephead, that was a big one. They had thought the fish always went into the [La Jolla] caves. Fisherman would say they always go into the caves and it's like how do they know that? It wasn't until later when we started to dive that I realized they don't go into caves and that half of what you learn from a fisherman was bullshit because no one had ever been there.

Ashleigh: Could you tell us about when you started diving?

Chuck: I learned to snorkel-- I know you asked about the first time I wore a mask, and I don't remember that. I learned to snorkel and skin dive initially in the mouth of San Diego River. And the jetty. The Ocean Beach jetty was new, they were still dredging out the bay. I remember going down there and snorkel—actually just swim around with just a facemask, I didn't even have a snorkel for hours. And then I got a spear and would spear halibut and things like that in the shallow water in the mouth of the flood-control channel. It filtered through the jetty and they would all coalesce there. The nice thing was, you could stay in the water until you got so cold you are shaking so bad that you couldn't do anything, and then you come out and lay on the big dredge pipe because it would get hot in the sun, and get warm then go back in the water, that sort of-- that is how it kind of started. And then I managed to get swim fins and a couple of things, in those days there were no wetsuits, so you always got cold. You wore a sweater, I know we used to wear the Navy watch sweaters, those wool scratchy sweaters that helped keep some of the water from recirculating and that worked pretty well. Then spearfishing, originally with a hand spear and then getting finally a spear gun, I must've been fourteen or something like that.

Paul: So that would've been '54.

Chuck: Yes, around '54.

Paul: That's the same time I got one, too.

Chuck: I remember getting an arbalete, the French spear gun. That was a major breakthrough. Oh, I should mention that although—well, at Point Loma High School Jack Prodanovich was our janitor there, he and I never really talked about diving but I would see him and I spent a lot of time with Jim [Stewart] later, and most of the Bottom Scratchers I knew personally. They were all hanging around here someplace. At one time or another.

Paul: What was your first scuba dive?

Chuck: My first scuba dive was off the coast of the pier here on the sand dollar beds. It was ’55. I was going to bring all of my old Scripps dive cards-- I forgot that. I will send it to you. I think-- I'm trying to remember who signed it. For a long time I had my original 25 foot card, and it was signed by Andy Retmintzer and Connie Limbaugh who were the two people who taught me. And then my next card was a sixty footer, a 60 foot card signed by Connie and I think Wheeler North. I can't remember, but I still got that card.

Paul: Your memory is great. So you actually came over here. How did you hook up as a kid from Point Loma High with all the heavyweights here at Scripps?

Chuck: That is a story in itself as well. We had moved off the boat, into a house on sStern Street, near Point Loma High School. And our next-door neighbor was a fellow named Mick Mahalco I think was his last name. He was one of these really interesting old guys to have next-doo. He was an ex Flying Tiger, and he flew one of the Doolittle missions and stuff like that from World War II. He was the skipper of a fishing boat, a powerboat. I can't remember the name of the boat. It had something to do with Arizona. It was an old converted sixty-three foot AVR, it was an old it was a small PT boat. It belonged to some wealthy person and he was a captain. Mickey was an inventor, and he made these electric fishing reels, and he rigged the boat with 12 V plug-in so they could fish deep water. He worked periodically with Karl Hubbs, fishing for deepwater things with this wire, those days we used to use wire. And he was telling me one day that, I'm going between junior high and the ninth grade and going to high school. At the beginning of summer. And he told me there were some jobs, summer jobs for high school students out at Scripps. And I thought boy, that sounds great. But it had to be sixteen, but because I had been working on those sportfishing boats, my dad had become really tired of taking me to work at 4 o'clock in the morning. I’d had a motor scooter but the cops stopped me and told me I couldn’t drive a motor scooter without a license. I knew how to drive anything, I knew cars. My dad took me to the DMV and we lied about my age. I so had a drivers license at fifteen, and I had a car. So I drove out here, and just walking around—and you know, I had never been particularly shy, but I found out I was supposed to talk to this person and I went in and told him that I wanted to work here for the summer. I did not care what kind of job it was, I would do anything. He gave me-- we had a pleasant chat, he was a nice old gentleman and he gave me a little tour of campus and we visited Ted Walker, working on lateral lines. And whales. And biochemistry with Dennis Fox, Wheeler and those people. And I can't remember that what the third one was, but I was given three, introduced to three people, and I went with Wheeler.

Paul: So this was Wheeler in 55, he had the kelp program going by then?

Chuck: It did not start until fifty-six.

Paul: I thought it started in fifty-four.

Chuck: I don't know, I was just a kid. But Wheeler was starting to set up to do that. So, who was here? There were three people. Dennis Fox who was a delightful old guy, Eugene Corcoran, Jim Kittredge in the Department of biochemistry. And Art Kelly, and Wheeler. I think that was it at the time. Art was working on sea lions. I know some of our earliest assignments were taking Art around. What happened was within a couple of weeks people realized that I had some “talents” with boat handling, that was second nature to me. So I got shipped out all kinds of places. One of the earliest trips was to Turtle Bay, that must've been 1955. They sent the Black Douglas that old NMFS boat, the bureau of commercial fisheries boat. It was an old sailing boat prior to World War II. They had it for years, even before I started. Every year, when they pulled it out of the water and send out and sandblasted it, it’d blast a hole in the hull and they’d have to patch it. It was terrifying. Anyway, they shipped out to go to Turtle Bay and pick up six geologists that they had left their two months before. That was an interesting experience. I was relegated to taking people to shore and such because I could row you in and out through the surf here and get you in, and you may not be dry, but you would be in one piece. And with Art Kelly he was collecting sea lions in Coronado Islands, so he would take out the old T441 buoy boat sometimes. He would shoot sea lions from the boat.

Paul: In Mexico.

Chuck: Well yeah, of course in Mexico. Things were different back then. They had me at the end of the rope with a knife, and I would have to swim to shore and climb out of the water in this sea lion rookery, get to swim through all of these guys, and cut a hole in the flippers, run the rope through and tie it and then they’d drag it back out to the boat. I would swim back out after it. With a great white behind me.

[LAUGHTER]

Paul: There probably was!

Ashleigh: You didn’t think about sharks then?

Chuck: I never thought about it. I don’t think I thought about sharks until 1955, fifty-six, fifty-seven, you know when that guy got eaten.

Paul: Until the guy got eaten in 1959.

Chuck: Right, until then. And those were the warm water years, ’58, ’59.

Paul: Yeah, I wanted to get to that eventually. And I want to walk you through that. But why don't you finish the story. You were fifteen?

Chuck: Well, yeah. That's just kind of the types of jobs I'd have. I was fifteen and I was already an "accomplished" spear fisherman. They were going to have a dive class, and I thought, Gee I'd like to do that. And the dive locker at the time was right down there, it was a concrete pad about as big as these two tables and it had a white shed on it with the scuba tanks stacked in there and there was a small compressor and that was it. The dive classes were down at the Beach & Tennis Club.

Paul: And your first one was taught by Connie [Limbaugh]?

Chuck: Well, for my class it was Limbaugh and Andy [Rechnitzer], and they worked back and forth. And then they both signed the card. Andy I kept in touch with for many years.

Paul: Andy and I did a dive illegally in the Antarctic once. But that's another story—we'll get there.

Chuck: We've all had stories like that.

Paul: So you took your dive class and your first group of dives were in La Jolla Canyon and that area?

Chuck: No, off the end of the pier usually. At that time Ray Galardi was work—and Fager was already here working on the sand dollar bids.

Paul: Yes, Fager came here in '52 and Galardi was one of his early students.

Chuck: Yeah, so those were my very first dives. Then I quickly went to the kelp bed stuff.

Paul: So you hooked up with Wheeler right away '55, '56? And you were a buddy diver on the kelp stuff in the early 50s. Was there kelp there then or had the warm water years wiped it out yet?

Chuck: There was still kelp. And I did the '57 Baja trip-- there were two kelp surveys going on then. There was one in the Channel Islands and I didn't take part in that one. But then there was, on the Orca we went to La Paz. We dove in all of the kelp beds all the way down the coast in 1957. So there was a chance to dive in La Paz, San Geronimo, Sacramento reef, in all of those places. They were amazing.

Paul: Did people associate at that time the kelps with the upwelling or was that a little later?

Chuck: I think that was later. I don't remember discussion of that then.

Paul: By the early ‘60s Carl Hubbs was all over that and he had people driving down taking temperatures, and Al Stover was into it. They were very into it not very long after that.

Chuck: Al was a landmark down there. We used to do a lot of stuff down in Tampico there and farther down, and everyone along the entire coast knew Al.

Paul: And you remember the Tampico story. Did you dive on that? And were you part of that?

Chuck: Many times.

Paul: Tell us about that, she has not heard that.

Chuck: You need to go on to our MBC website.

Ashleigh: I have been on it before, but not recently.

Chuck: There's a whole section of slides about Wheeler and his story. I think you were there, Paul, at his service that I put together. I just made a collection of Wheeler stories.

Paul: That's harvest that later and maximize the time we’ve got. But basically Tampico was a Japanese ship that ran aground.

Chuck: I think it was Panamanian registry. It was a tanker-- I am trying to remember the year. Just south of Punta Banda. It was full of diesel, primarily. It sprung a leak above the waterline and they pulled into San Diego to get repairs. I think they stayed twenty-four hours and the port threw them out because they were leaking diesel everywhere. So they went south to Ensenada, picked up a few welders, and then they got kicked out of there. So they steamed offshore 60 miles or so or so and this was early summer, like May. A day like today. This was before-- when you had to the sextant kind of thing to find your way. It took them three days, just drifting. They got patched up and then they had to take the welders back to Ensenada. Well, they set a course for Ensenada and they missed it and they were not sure where they were at. They went ashore just north of Punta Cabras. There's a place called Tampico and I don't think anybody knows why. But the ship went agound and just spilled diesel everywhere. Then we got there-- I don't know how we ever got word of that.

Paul: Well, the oil wiped out the urchins so the kelp started coming in. Wheeler had a house in Punta Banda didn’t he?

Chuck: No, that was much later. I built that for him so I remember it very well. That is when I introduced CalTech-ers to physical labor, and that's another story. Anyway, the ship went aground and diesel went everywhere, and of course it's extremely toxic and killed everything except for the algae. The beach, I could not stand the smell. It was 8 to 10 feet of dead mussels, abalone, lobster, everything just stacked up for miles and miles. And the algal community- what a perfect situation for field experiments. No herbivores survived, and the so algae just went berserk. So Wheeler followed that, followed it for thirty years. I dove with Wheeler then just after it happened, and then when I went back to work for Wheeler after being at Cal Tech we were going back down and rechecking that.
Ashleigh: Were there any particular safety protocols you had to follow to dive in something so toxic? Or had enough time passed that it was no longer highly toxic?

Chuck: No, it was not toxic by then. But you bring up some interesting points because there were no protocols. Right? We have all done this, I can remember complaining about bad air in the surface supply system, and bad air meant that it tasted funny and it made a film on the inside of your mask.

Paul: And your teeth and tongue were all slippery from the oil.

Chuck: I remember that well! But we all survived! Remember in the old days, we had the first decompression tables which were the Navy tables but there was nothing about repetitive dives and of course we are all-- the scientific diving community was certainly good guinea pigs for repetitive dives because geez, we all pushed into the limit and beyond, I'm sure.

Paul: I'd never even heard of that stuff. You had diving classes, I didn't.

Chuck: There was nothing in my dive class about repetitive dives, but I go through my old dive logs and sometimes I had 8 to 10 dives a day, at maybe 40 to 50 feet or something like that.

Paul: You want to tell—because we don't have any record of it and Dave Layton I think has forgotten most of it, but do you want to talk about the transects and what Wheeler was doing before the warm water years?

Chuck: I will do the best I can. These are the earliest things I can remember. We were doing lots of "random" transactions and quadrants. Looking at-- counting through the quadrants and the transects and trying to do it randomly. But there is no such thing as "random". Wheeler would kind of—"this is where we'll sample", and these would be the "stations". And then, we would spin a toy roulette wheel that he had with thirty-six numbers. You turn them into degrees, you would spin it and get a number and that would be the heading that you would run. And then, before we had computers, there were little books of random numbers that you could buy. And you could pick a random number and that would be the number of meters that you go in that direction. And then you would spin five or six turns, you'd be stretching out the tape--now we have fiberglass surveyors tape but back then we had steel, big 100 m hundred foot surveyors tape, and Wheeler would keep those in a big can of diesel oil because otherwise they would rust up. So you would stretch them out and marking and then going in different directions and go back and count the number of kelp plants or whatever, do a census on both sides. And then, that included numbers of stipes to give you some idea.

Ashleigh: And fish? Or just algae?

Chuck: Just algae as I remember at first. And then we ran straight transactions, running hundreds of meters with just two people, 1 m and 2 m down and you would count all of the stipes.

Paul: This was still with a two-hose regulator, sliding around on your back?

Chuck: Yes. As far as I'm concerned I think that was the perfect situation, every tank had it's backpack. You never had to worry about all that stuff now that you have to hook up and that costs $400. It was just some canvas straps and it worked just fine. But you are right, those double-hose regulators, you probably know about the old days when you really got out of breath, because the double hose regulator though inhalation takes some work, the biggest fatigue agent is the exhalation and you really have to work at that, and if you are really working hard underwater, swimming hard, you really got tired and you'd fall behind. And so, you would turn over on your back and put the regulator at a higher pressure until you got some positive airflow and that was how you cleared your hoses back in those days.

Paul: Turn on your left side to clear the hose.

Chuck: I remember my first regulator, which I still have, it did not have the one-way valve in the mouthpiece so everything, the whole hose, intake side and everything flooded. You had to make sure that you got everything rinsed out afterwards. But they breathe hard. When I would teach our Cal Tech students to dive each summer, later in the late 60s, I always made them make one dive with the old two-hose regulator and they immediately would tell me that it was broken. They couldn't get any air out of it and I'd say no, that is just the way that it works. Where were we?

Paul: You have an idea of how much kelp there was more or less, can you tell us what it seemed like swimming around-- most of the work was in 45 feet of water in the kelp bed as I recall. 45 to 60 feet. In ’54, ‘55’, ’56. There was still a lot of kelp there?

Chuck: A lot of kelp. Going back a little farther to my sport fishing experience, I did a lot of fishing off La Jolla and Point Loma. And Point Loma in particular, when you came out to go fishing, you had to make a decision whether you're going to go on the inside edge of the kelp and fish there or the outside because you could not cut through, the canopy was really think. I could remember canopies being 6 feet. Maybe eight.

Paul: Those were cold water years in the late 40s and early 50s.

Chuck: Yeah, lots of plants, 10 to 12 stipes each, really close together. Big canopies. Lots of big fish, lots of big abalone. Not much understory, too shady for much understory. Sometimes you would have difficulty seeing what you were writing on your slate because the light was so dim.

Paul: This is new, and important.

Chuck: Yeah, it's a lot different. People tend to—and we have had the same conversation lots of times-- on this moving baseline. When you or I go back and dive in a kelp bed, I can look back and see what it looked like in ‘55 mentally. But when you dive it you can only look back say, a few years ago and so it does not look radically different to you. But it is radically different. That goes for other habitats as well. I can remember one of our AAUS meetings here at Scripps, probably in the 80s, and after the meeting we went on a dive trip out to the Coronado's, on the Sand Dollar with Bill Johnson. And I was stunned, I hadn’t been to the Middle Grounds-- that's where we dove—in years and years and it looked devastated. It didn't look like anything that I remembered. Things change.

Ashleigh: Where were some of your favorite spots for spearfishing?

Chuck: I think for spearfishing La Jolla Cove and Windansea, around that area was always very productive. There were some good places in Ocean Beach but the water tended to be a lot dirtier to there and harder to see. When we only have visibility of eight or 10 feet it's hard to sneak up on anything.

Paul: Do you remember back working with Wheeler still when the warm waters came in and the kelp disappeared because my reading and talking to older people is that they did not understand that it was El Nino, but they still called it the warm water years and they blamed it on the urchins and on the sewer water coming out the bay-- there was raw sewage pouring out of the bay because the [Pt. Loma] outfall wasn’t constructed til 1963.

Chuck: That is right. I think the two in retrospect worked concurrently. We had the warm water years and everybody recognized them as water years, but we had the sewer outfall, as I recall was like at 10th St. or something like that downtown.

Paul: It was very dirty.

Chuck: Yes, very dirty and looking at the kelp map, and the kind of sequence of disappearance of the Point Loma kelp, you can see that it was in that plume, that wraps around the end of the point. That is where it started to disappear, and sequentially worked its way up the coast. I don't think it ever had an effect on the La Jolla kelp bed, I don't recall. But it certainly did on the Point Loma kelp bed. So as the treatment process improved and they moved the outfall—but that was much later.

Paul: The kelp bed came back because cold water came back and that still had this convergence of a process.

Chuck: Exactly.

Paul: But you guys were surveying at that time?

Chuck: Well I was definitely diving but I’m not certain we were doing a lot of surveying. I don't recall a lot of transects.

Paul: Wheeler’s program came to an end for a while and Dave Layton told us they discovered how to lyme urchins. So they started lyming urchins and I forgot the data on that, but you must have been involved with that at some point.

Chuck: I think I had left. I left working on the kelp program in ‘61. Let's see, the summer of ‘60, here at Scripps I signed up, if you will, for the summer. I got a different summer “job”, with Bill Van Dorn. And I went to Central Pacific that summer to install the very first tsunami recording stations. That was a fun trip. With some interesting people.

Paul: And that was stimulated by the tsunami in Hawaii right? In Hilo.

Chuck: Right, the one that wiped out a bunch of people. It was a very interesting trip because we were all under an ONR grant, and we were all given ranks, we were given military orders. And Bill was probably like an admiral or something like that. It was really interesting, I have often wondered, I have seen Van Dorn in recent years, probably not in the last five. But I have often wondered, whether or not it was part of some secret activity. Because we all had to have secret clearances.

Paul: Scripps had a lot of classified research going on.

Chuck: Yeah. At that period of time I don't know if we were really looking at tsunamis or something, or other kinds of underground testing. We had six of us, something like that.

Paul: By that time you were in college, at San Diego State?

Chuck: Yes. I took the summer-- and I had two kids by that time, married with two kids.

Paul: Wow. When you were twenty?

Chuck: Younger than that.

Paul: Wow.

Chuck: Yeah. I always try to do things the hard way. It was very interesting because we just had anything that we wanted. You could walk in to the airport in Hilo and whatever, and we'd just commandeer a helicopter to fly us over Hilo. It was all you had to do. We flew over Hilo with people scattered. I remember looking down, and thinking—wow. Below you-- this was like a month or something like that after the tsunami-- it was a vector diagram of wave watch, with parking meters, parking meters and debris. It had just wiped out all of the parking meters and the buildings were gone. Here were these streets and wreckage and all of these parking meters. They were still in the ground bent into this vector, it was incredible. And it was very interesting in the summer, we spent six weeks on Canton Island, with the Phoenix group.

Paul: Did you run into John Isaacs then?

Chuck: Not in that group, I never ran into him on that project. What a wonderful guy. Anyway, what happened is they needed somebody with a deeper dive certificate because we were running the cables over to the edge of the reef. I got sent on that one. I can't remember. I didn't have a 200 foot card then.

Paul: The reef edge would have been 130.

Chuck: Canton was particularly fascinating. At 1500 feet off the edge of the fringe reef, you are basically in 1000 feet of water. It was like an abyss. It just ran straight down.

Paul: So you ran down the reef front?

Chuck: Yes, to 1000 feet. It was mostly garden hose and one instrument cable that was filled with kerosene. There were bigger PVC tubes at the bottom. It was basically just a big container of kerosene, JP-5 that we got from the Navy with a transducer in it so you could pick up those long period waves. The most interesting person was Saks Montgomery. He was a self-made “engineer” and an old school buddy of Van Dorn. And he was related to those Saks Fifth Avenue people, he got named after his uncle or something and you would hope that they gave him some money but they never did. He was the most frustrating person to have around you, he always had the “right answer”, and he would rip off doing things. And Even as a college student I am thinking, “I don't think that is going to work.” Anyway, he stayed that summer, but he got fired and sent off someplace. He became a guy that invented Skid Lids, one of the very first bicycle helmets. Those little funny helmets.

Paul: Yeah, I wore those.

Chuck: Anyway, it was a very interesting thing.

Paul: Let me throw one more name out just out of curiosity to maybe connect some of my Antarctic diving oral histories I did for the library. Do you remember Jack Littlepage? Does that name ring a bell? He was at SDSU and worked for Scripps and Ozzy Honhansson.

Chuck: No.

Paul: How about Carl Tuthill up at the aquarium?

Chuck: I remember him, and Sam Hinton. I was just telling somebody about Sam, he was one of my favorite people. We used to go to the aquarium at lunchtime and he’d play and sing and have a good time. Those were fun days.

Paul: So you went to college here and you kept on working with all of these connections because he knew everybody knew you were a diver, so you got a really cool trip out there to the reef edge.

Chuck: Yeah, that was great. And then the kelp program ended. And I think Wheeler went to work for a short period of time. Anyway tt ended. But the people that I was working with on the kelp program, Dave Layton was on the program in those days, and Jay Quast. And Jay was the person that I probably spent the most time with in the latter years. If you looked at the kelp bed resources, and all of the figures it’s mostly he and I. He left and went to Auk Bay. He is gone now, but he and I stayed in touch until fifteen years ago or so. At any rate, he was a fish person. A great guy. When the kelp program ended, I was looking for another job and they recommended the National Marine Fisheries Service, or what was the Bureau of Commercial Fisheries in those days, and I thought that would work out well. I talked to them and got picked up immediately and worked in the tuna behavior group. The Bureau of Commercial Fisheries at that time was split up into two groups. The CALCOFI group which was here on campus in Hubbs' old office. Right across from the old aquarium. Where the parking lot is now. And the tuna group which was relatively new, we were barracks buildings. That's where I started out there. I was a fisheries technician when I started there. That was great. A lot more see time, and you came and talked about diving a bit. I became the regional diving safety officer. I was in charge of diving operations when I was still in college, within California and Nevada and Arizona. But there was nobody in Nevada or Arizona.

Paul: So you are the college kid in charge of the whole program which is basically you.

Chuck: There were basically five of us. Frank Hester, he was one of Carl's students.

Paul: I never met him either.

Chuck: Yea, Frank, he was one of the brightest people I knew.

Paul: Did you interact with Carl [Hubbs] much?

Chuck: Well, he and Laura knew me by first name. And I'd call them by first name. We went on enough trips into Baja that they were along on. On at least a couple, they were in the camp next to us and suddenly took over everything. We would be doing kelp work and suddenly it turned into a fish projects. Collecting lizards, that stuff. That was another incredible person. I never met anybody like those two. Have you heard a lot of Hubbs stories?

Ashleigh: Of course. I never get tired of this.

Chuck: Two I can remember that struck me so funny at the time. We were driving someplace south along the coast south of El Rosario somewhere I can't remember. And Karl was in his old green Jeepster is in front, and he is driving 40 miles an hour down the washboard. And it was so typical of Carl, all of a sudden his brakes lock up and everything stops and the door flies open, and here he comes flying out the door running across the desert and does a giant dive and grabs a lizard. He caught it. And he brings it back, and his old Jeepstere had a split back, it was kind of a ratchet thing that held it open. And it was so typical of Carl, he just hurls the door open and he's looking for a bag, and of course he never latched the thing just threw it open, stuck his head inside. That thing came down and hit him in the back of the head and caused some bleeding, so he's holding on to the lizard and holding onto

his head, and here he's yelling at Laura. Who is still sitting in the car! He's yelling, "Dammit Laura!"
[Laughter]
And she didn't have anything to do with it. But he was full blast all of the time. I never met anybody like that. The other time I can remember we were at Punta Banda, at Papalote Bay there, and we were camped out, Wheeler had a little lab there. But Carl was right next to us, 50 m away, something like that. And he was doing fish stuff and we were doing kelp stuff. He had his summer help with him and he had a high school student, and all of a sudden you could hear Carl just bellowing, like an old elephant seal. He is just pissed, stuff's crashing and Laura is yelling, and the place was just chaos. And this kid comes running over to our camp and is like what the hell is going on over there. "I don't know!". Well what we found out later, because he finally went back to their camp, is that they were eating breakfast, and Laura tells this high school kid to clean up and washed the dishes. And he tells her and Carl, "I wasn't hired to wash dishes, I was hired to do science." I can't imagine. Can you imagine anything worse to say to Carl Hubbs? He just went ballistic. We all thought, "You said *what?*" He was lucky that he didn't get killed.

Paul: Laura was older than Carl.

Chuck: Was she? I had no idea. Pleasant lady. Usually she was damage control behind Carl. He was a bull in a china shop.

Paul: She was a sweetheart. You remember Dona Esperanza? She used to keep track of Carl. I took my kids down there when it was still a pretty rough dirt road and we'd always stop to talk to her. She would tell me stories about Carl too, you know him disappearing and her sending people down to find him.

Chuck: I'm pretty certain last I checked, she is still alive. She's 104.

Paul: No shit, she's still alive?

Paul: She is a really interesting lady, everyone knows her. She has a little museum there.

Ashleigh: I was there last December.

Chuck: Kathy and I and friends helped her put the museum together. We spent a couple of days there making labels and moving furniture around, painting walls and all of that kind of stuff.

Ashleigh: You did a great job.

Chuck: And she's got a picture of Carl up and I remember talking to her about it, that was probably ten or twelve years ago, something like that. She divides her timeline into the scientificos and the adventurers, all kind of coming down the road. And then there were scientists at that period of the time in the 50s. And then the rest of the tourist after the roads were build. And you know she still says when it was bad roads it was good people. When it was good roads, it was bad people. Which is true.

Ashleigh: Very true! Luckily where I head past there are very bad roads still.

Paul: Did you get to El Marmol before they stole all the trucks and things?

Chuck: Yeah, there was a period of time, a long period of time when I did visit but I mean I was there in the early '50s. I had a friend there.

Paul: El Marmol had an airstrip then at that point. And the trucks all lined up.

Chuck: I took Kathy there. About eighty-seven.

Paul: By that time the trucks were gone and everything was stripped.

Chuck: Everything was stripped. Kathy and I were married by that time and she had never been to Baja so it was a whole new experience for her and she loved it. She is like a Mexican at heart like me, actually I'm really half Mexican anyway. At any rate, we were coming back from a rock art trip, with UCLA. Down to the central part of Baja. We're driving back, and we'd been on mule and burro for eight days and we were on the highway coming back with a brand new Land Cruiser back then. We got to the turnoff for El Marmol off of the highway and I asked her, "Did you read about El Marmol?" and she said "No, what's there?" And I thought we'd have to go see it. Because in the old days I drove to La Paz when I was eleven or twelve twice with my family friends. And this was the last place you could count on getting anything fixed, or get gas and things because there were people there. It was a going mining operation. So we drove in there and everything was gone. There was a fireplace still standing and part of the ruins of some of the foundations and I said that used to be the superintendent's house. So we drove over, and there was a little hill, and we parked and got out and walked around the area and I was showing her these big blocks of onyx, and we went to leave and I went back to get the car, which was maybe 100 m away or something like that. I was going to back it down and pick her up, so I'm backing the car up and all of a sudden there is a bump, a big bump, and I am stopped. And so I think I am backed into something, I did not see. So I honked, and Kathy looks up at at me, she is maybe 100 feet away now and she just starts waving her arms and screaming. I am just like what? I get out of the car, and I had backed into an old open well. It was a hole, maybe 15 feet in diameter. And it goes forever down. When we drove up, the hood was here. I could not see over it, and when I went to back up, it just gave way. I was right on the edge of the hole and so now I've got the differential sitting on the ground and one wheel hanging in the air. And the other opposite front wheel in the air. Even though I have four-wheel drive I don't have locking differentials on that car, I am stuck. I can't get out.

Ashleigh: Oh no!

Chuck: I said we will have to walk out. It was about 15 km back to the road.

Paul: The ranch was gone.

Chuck: The ranch was gone and there was still a water tank, but it was still a long ways. I had water, and unfortunately it was a 2 1/2 gallon container which is heavy. We just started walking back to the road, we had a CB radio but nobody was on CB. We start walking down the road and we got maybe a mile. We had a pickup truck coming at us and we stopped them and it was two Air Force guys from Colorado, got Colardo plates and a couple of weeks off from Colorado, stationed in Colorado and they decided to go to Baja and that they would stop and take a look at El Marmol. What were the chances? They said we will give you a hand and pull you out. I said I don't think you could pull us out. They were in a little Toyota pickup and the old Land Cruiser was heavy as hell and they tried and could not get us out. Now we got some backup and needed a way to get out. So you switched over, to Baja time and you did whatever you needed here so they ended up, I looked around and to see what resources we had. We had a bulldozer, and it had an air start on it but they had taken the battery for the little compressor.

Paul: There was a bulldozer still sitting there in the '80s?

Chuck: It was all rusty, but they were still harvesting occasionally. There was a bulldozer, but it was an air start. They had to run a compressor to get the air compressor going and then the air start on the diesel engine. Anyway I took the battery out of the Land Cruiser and got the compressor going. I would be driving a bulldozer and I guess either fill the hole in or whatever.

Paul: The Air Force guys were still with you?

Chuck: Yeah, we had more people to help out. I didn't have to start the bulldozer, because Kathy found one of these, it looks like a ladder. It has ball bearings on it and they use it for loading trucks with cargo. She found an old rusty one and I think they used it to load trucks of marmol. It was long enough to span over that, over that hole. I thought well, I got ropes in the car-- I always carry extra tools and everything. We ended up, I got a high lift jack and we jacked up car. I blocked it up and then rigged ropes and drug it across, slipped it underneath the wheel that was hanging in the air and the lowered the car onto that. And then I got in and drove it out. I was all over in, it only took eight minutes. Once we got it done.

Paul: So you never turned the cat over?

Chuck: I never had to. And we blocked the hold with rocks and sand so nobody else had to go through that.

Ashleigh: One thing I'm interested in that I've been hearing commonalities among divers I've been talking to who dove the kelp forests off La Jolla very often over the years regarding changes in particular populations. Abalone being one, lobsters, seabass, and sheephead were the big stand outs. They are charismatic and noticeable so even if you're not looking for them you notice that, and I was wondering if maybe you could describe first some of the biggest fish that you saw, and then how those populations and individual sizes declined over the years.

Chuck: Of course, all of them have declined significantly. Let me backtrack for a minute. When I occasionally am invited to talk to recent graduates or fisheries biologists that are just starting careers, one of the things I always tell them that they have to be aware of and they don't have to agree, but you will have to be aware of what will drive you nuts-- that nobody calls fisheries biologists until there is less than 10% of the original stock left. Number two, what was number two? Well the next one is that you are all going to go out and do great science. You have all of the tools. But the regulations and closures and all of that are based on political decisions and not scientific decisions. I forgot number what number two was, but that is kind of it. You wonder why fisheries biologists—why decision-makers don't pay any attention to the simple observation that there are fewer fish and they are getting smaller. And they write regulations and then nobody stops to see if they work. That is the other thing that drives me nuts. So, abalone. Of course, abalone in the early days of diving were kind of a staple. Whenever we were going to have birthday parties of any kind of party, somebody'd go out and get some abalone. You could always do that. I remember many times at Point Loma, even the outer edge of La Jolla, but particularly Point Loma if you drove in the '50s on the outer edge of the kelp bed, which would be like 75 feet, as you were 20 feet off the bottom, because that is kind of a pavement-like bottom out there, not a lot of high relief, you could look down and see eight or ten abalone below you. See you could pick them out. And of course, they are all gone now. And there are some people I know that wrote these wonderful papers on the sequential decimation of abalone. And lobsters are kind of the same way. It used to be that you could get lobster just about any time you wanted. You were going to have friends over? No problem, go out and get some lobster. Those days are gone. Sheephead, there used to be lots and lots of the big males. You don't see them anymore. When I was a kid working on a sport boat, you always threw them back because "They did not taste very good." I'd heard that so many times from fishermen, that they tasted like iodine or something. That was all absolute BS, they just never tried it.

Ashleigh: But they're really good!

Chuck: Yes. Now you hear that sheephead tastes like—I heard this just recently, that they taste like lobster because that's what they eat or something like that. Sheephead is wonderful. Fleshy fish. You can do great stews with it. It holds together well. But all of those big males now are gone. I remember working out on San Nicholas Island with Cowan and some of those other guys, that is the only place you could see the big sheephead swimming around.

Paul: Big lobsters, too.

Chuck: And big lobsters too. Yeah. There is nothing more spectacular than you know, you used to see big sheephead routinely at 20 to 30 pounds. I can remember once working with Wheeler, and there were times when he was working on growth of individual stipes. So this is what we did for many years, is every weekend all winter long was to go out and measure kelp stipes, and he had them all labeled with tags and you would have to untangle them without damaging the leaves, stretch them out, and my job was to hold the end of the tape measure at the base of the dichotomy. And then he would give it a standard stretch and measure the total length of that. And he was going out 100 feet or so away from his buddy. And you had to hang on tight because you never knew when exactly he was going to start to pull. And on one occasion, I was holding the tape measure and there was a big 30 pound sheephead out there and he was swimming back and forth and back and forth and I figured he was just waiting for something. And he keeps rushing in right into my face and on occasion I am poking him, and I thought he was going to tear my throat out and then Wheeler started pulling on the tape and there was nothing I could do, I had to hold on. And that big guy rushed in and I must have been—there must have been a big brittle star or something right here [gestures]. You could hear his jaw snap shut right here. It must have been floating right there, something I'd knocked loose from the holdfast or something. I thought, "he tried to kill me!"

Paul: Did you ever get bumped by one of those guys? They're territorial.

SPEAKER2: No, I didn't. I never got bumped. But they're, wow—you look at those big teeth. They're pretty awesome. Where were we going with this?

Ashleigh: That was a great story! That was where we were going with it. I just want to shift a little bit quickly because I am also interested in gear development over time and I'm wondering-- when you were saying earlier about some of the grievances that you would have to deal with negotiating the double hose regulators-- I am wondering, what were some of the most intellectual shifts in technology with dive gear and how did those help with not only the pleasure of diving but also with helping data collecting and facilitate it more?

Chuck: Well that's a tough one. I think the single hose regulator—well, actually the old double hose, what was it, The Master? What was one that you used in the Antarctic for a long time?

Paul: Shit, I still have it if you want it.

[LAUGHTER]

Chuck: It had the crown on it. But they breathed easier. That was the major thing.

Paul: I made one out of the B-29 regulator and it breathed okay. But the next commercial one that I used, it was that Aqua Master, whatever it was that I think that we had in the Antarctic and it actually breathed quite easily. You'd just think about it and you had the air. I liked it.

Chuck: Oh, yeah. If they still made those I'd buy one. The double hose I think, to me was much more comfortable.

Paul: The one that you had, did it have a really good second stage? Because that's what they developed was that sensitive second stage.

Chuck: I had an Aqua-- I don't have it anymore but I had one, and you are right. They breathe much easier. What I liked about the double hose, they were symmetrical in your mouth. You did not have something pulling to one side.

Paul: Exactly! I've got TMJ from these things. The double-hose, they were fine! I hadn't thought of that.

Chuck: Yeah, they still drive me nuts, my regulators.

Paul: I mean they weren't that hard to clear, just having to turn to once side.

Chuck: Yeah. If they still made Aqua Masters, that would be my most preferred regulator.

Paul: I prefer them, too. It would be interesting now to have somebody make them and still try them out.

Chuck: Yeah! Probably too expensive. Or at least more expensive than what they're making now.

Paul: In the Antarctic we had use them into the 80s. You had hoses that did not freeze up. And so, I've made just over 1,000 dives with them, just in the Antarctic, with those things and I loved it.

Chuck: Yeah. Some of the other changes that I don't kind of necessarily—well. I have real strong feelings about the capabilities of divers being trained today on the recreational end of things. I have no problems with the scientific divers. Recreational divers do not get adequate training. Rather, absolutely so far from it. It's bizarre. And diving in the '50s and '60s people that were diving and taking up diving were already water people, so they were comfortable in the water. They were surfing, they were skin diving. They were water people. Now, because they want to build the industry they make it simpler and simpler and so now to be honest you probably don't even have to know how to swim. I always kind of liked what they now I think they call a "snorkeling vest", the horse collar kind of BC. It's clean, does not have a lot of crap on it, you're not dragging a bunch of stuff. But you can't buy them because now it's not really a buoyancy compensator kind of thing, it's so you don't have to swim. Now, it's what I call push-button diving, you know? You're not even--

Paul: It has a huge impact on your drag.

Chuck: Awful!

Paul: Before you even had see-view gauges— even the single stage regulators were at least twice as easy to dive because you don't have any of that drag. No jacket, just your wetsuit, and no hoses, nothing! You just swim and it's so easy.

Chuck: Exactly. When the [inaudible] group, when they were working in Bahia de Concepcion, I put them up at my house. I don't know if you were ever aware of that, but I had heard they were doing the second year of the circulation study and I can't remember who I ran into—it might've been Clint. I think it was Clint, initially. But they had been, in the previous year-- in the summertime camped out at one of the beaches and they had computers and all that stuff and your camped out in the sand for two weeks. I said, well my house is open, I'll be there. We've got three bedrooms and air-conditioning, and the bedrooms, we've got electricity and everything that you need. A launch ramp right there. So they had fifteen guys, okay? Worst houseguests in the entire world. And Kathy was in Chile with friends looking at rock art so I was by myself. Nobody did any dishes, nobody picked up after—

Paul: Really? Imagine what Carl Hubbs would've done!

[Laughter]

Chuck: And we had one young lady from La Paz, and at least once a day she would be standing facing me with her hands on my chest saying, "Tranquilo, Carlos! Tranquilo!" as I tried to figure out or ask who broke this or who did that. I mean it was bad.

Ashleigh: That's what you get for being a nice guy right?

[Laughter]

Chuck: Yes! At any rate they had a fellow from the East Coast that was a volunteer helping dive. And so they asked me if I wanted to dive. Well, at that time I did not have any tanks there but I had an old little compressor and a hookah outfit, so I get assigned to this guy and we're going out to recover current meters. So I loaded my compressor into my big panga and everything and got it set up on the bow and this guy is looking at me saying, "Is that what you are going to dive with?" I said, "Oh yeah. It works really well. I don't have that big tank on my back." And I didn't even have a wetsuit, just a T-shirt and shorts and a small weight belt. He said, "You're going to die. You are going to be sucking in carbon monoxide." I said, "No!"

[LAUGHTER]

Paul: He doesn't know about a mouth full of grease, does he?

[Laughter]

Chuck: So we make the first dive and I'm swimming circles around him. You know? You got all the flexibility, you don't have that big tank riding on your back, you don't have all of that stuff dragging and pockets of crap stuck all over you. It makes it much more comfortable. You come up to get out of the water and you just take your weight belt off, throw it in and jump in. It was a piece of cake. But the BCs, you know, now they are not flat, and I remember doing AAUS we did a lot of testing on that. In the largest ones we had 38 pounds of positive buoyancy fully inflated. Now what the hell do you need that for? Unless you are afraid of getting your face wet or something, I have no idea. And every year there are sport divers that die—

Paul: Like Mia [Tegner], that's how Mia died.

Chuck: --you push a button to go up and that thing keeps getting bigger and you keep accelerating and you end up coming out of the water like a Polaris missile. And if you held your breath for an instant—

Ashleigh: A split second, right.

Chuck: --you know, you're done.

Ashleigh: Have you ever had any close calls, safety-wise? Any bad dives that, you know, scared the crap out of you?

Chuck: Probably a few. Not very many.

Ashleigh: Nothing that would put you off of diving for a while or anything?

Chuck: No. Well, take that back. Late '50s—might've been mid-'50s. I was diving with as I recall Jim Stewart and I think it might have been Earl Murray. He used to be a geologist here. We were making a night dive off of the Cove, and in those days your dive light was one of those yellow rubber-covered flashlights.

Ashleigh: Like filled with, what'd you fill them with again? Petroleum or something?

Chuck: You could do that with mineral oil. We used to just take the lids out, and Vaseline it up and put a hose clamp around it. It was usually pretty good except your light turned on as soon as you got to 10 feet or something like that because the pressure would squeeze in on the push-button thing. We were swimming along the bottom and of course you made night dives and you know that the light is as big around as your light is so you've just got this little shaft of light. I was diving behind Stewart and Earl and we were swimming along, 60 feet. It was nine or 10 o'clock at night, and I had my light in front of my like this [gestures], and something swirls past me, past my shoulder. Big swirls. And snaggs my light right out of my hand, okay?

Ashleigh: Oh, shit.

[Laughter]

Chuck: And I never see it. It was gone in an instant, just boom!

Ashleigh: Oh my gosh, that's so scary. It gives me chills just sitting here!

Chuck: It might not have been “life threatening” but it definitely scared the crap out of me! And almost instantly I’m up between these two guys, you know, they’ve got lights and I don’t. And I didn’t know what came by, but it got me. To this day I would like to think it's probably a sea lion or something, but I had no idea. But I didn’t go on any night dives for probably maybe two years. I was like--

Ashleigh: You said, “I'm good.”

Chuck: Other than that, there were so few, few and far between.

Ashleigh: Which is good!

Chuck: Yeah! You know, well in that—there’s a book that Eric Hanauer wrote—

Ashleigh: Yes, “Diving Pioneers”.

Chuck: Yeah, “Diving Pioneers”. And he asked the same question and I think the one I responded to in there was diving someplace, as I recall it was off of Costa Rica someplace, and it was blue-water diving. We’d been doing underwater visibility experiments and w e were looking at ways to potentially make tuna nets more visible.

Ashleigh: To reduce bycatch?

Chuck: No, to keep tuna from sinking out, because the thermocline—Well, for most of the tuna the thermocline, the cold water would form the bottom of the bowl, if you will. And the tuna would tend to stay on top and give you time to purse the net. And when the thermocline was really deep—and that’s in excess of 300 feet-- the tuna would sometimes just sink out of the bottom and come out. So we were experimenting looking at ways to make a visual reference point down below, like a white stripe around the net or something, something that would look like a barrier. So we were doing a lot of this mid-water stuff, and this was before we developed any kind of mid-water diving techniques, tethers and all of that kind of stuff. And so, we’d finished doing that for the day and we had a shark cage that we made out of aluminum chain-link fencing. And we decided-- you kind of need to take some of our oceanographic instruments like a BT and plankton nets and things like that and we’ll tow them. So we’re in open water and we’ve got 200+ feet of visibility. And we’ll photograph them to see what it would actually look like going underwater. So three of us went down and the boat, an eighty-five footer, was going to go back and forth and do these different things. Well, we’re waiting for the BT they’re going to be towing, and we’re at around 70 feet or something because we wanted a picture of the boat and the instrument, you know, looking up. This was off Costa Rica mid-water. And I'm sitting on top of the cage, I think Frank Hester is sitting on top of the cage, and Don [Hofstede] was inside of the cage and we were just waiting for this thing to come by. And we're waiting, and the boat goes by, and we're waiting and we're waiting and then there's this kind of strange noise, kind of [imitates], and something hits my face mask and floods it for a second. And I clear it, and suddenly we realized it's the cable! The boat's turned too soon and the cable that they're towing, the BT cable they're towing is now coming across our vertical and the roaring sound was it hitting the edge of the cage. And you looked over the edge into the blue abyss—we're 20 miles off the coast at least, and here comes this BT and it's coming like a rocket. I was like oh, shit! And it hits the chain link fence, and it goes right through the fence and snaggs and all of a sudden we are being towed at 10 knots. We are plastered against the outside, and the poor guy on the inside was impaled-- impinged on the inside.

Ashleigh: Wow.

Chuck: It was like, "Oh my god, this is going to be bad."

[Laughter]
Chuck: You know? And then eventually, the BT flipped out of it. But it was just in that instant it was like oh shit, we are in a world of hurt. Those were the only two that came to mind.

Ashleigh: Well that's good, having just two are good.

Chuck: Yeah.

Ashleigh: This is really great. So, the last thing I wanted to ask you is if you could just describe what would be your perfect dream dive in San Diego. You know, where would it be, what would you be seeing, what year would it be, anything?

Chuck: Oh, I think the outer edge of La Jolla kelp is spectacular. The north branch of the canyon-- I haven't been there in decades and decades but it's pretty spectacular. Those would be my two favorite spots.

Paul: Even more favorite than any coral reefs?

Chuck: Than the coral reefs? Oh, yeah. And you know, I've been all over the central Pacific, South America and everywhere, diving so many places. But I still don't think that you just can't beat the good ol' Southern California kelp beds.

Ashleigh: I agree!

Paul: Yeah, when the water is clear. With the sun coming through--

Chuck: The water is so clear. Yeah, like all of those pictures of the kelp with the sun shining through. Yeah, it's just really spectacular. And, you know, we've been lots and lots of places. I was telling someone the other day, I can remember when AAUS was arguing with the carpenters and joiners unions and stuff and trying to get us a out of the commercial diving—

Ashleigh: With OSHA, right?

Chuck: Right. OSHA, the federal OSHA stuff. Well we had a group of us, probably eight of us I recall, we had made appointments to go meet with Congressmen. We split up and we made appointments with various Congressmen. We flew to Washington DC, spent the night in the hotel and divided up everybody's effort you know, blah blah blah. When we "left", a fellow Rick Richardson who used to be with Edison, he and I decided we'd go to the Cayman Islands. We were already on the East Coast, we figured we'd go to the Cayman Islands and we'd go diving. We got [James] Stewart and Glen Egstrom and—gosh, I can't remember who all was there but you know, a lot of old farts. And one of them was Phil Sharky from University of Connecticut. Okay anyway, they said "Oh, where you going?" Because we'd already made reservations you know, so we said, "Oh, we're going to the Buckaneer Inn on Cayman Brac," And a couple of people, one of them was Glenn Egstrom was there and he said, "Oh yeah, that's a good operation. It's the only place I've been where they really checked for certification cards." And I was like-- yeah, this is like 1981 or something. It was like, "Oh shit, I don't have a certification card!"

[Laughter]

Chuck: Nobody had ever asked me for a certification card! But they're gunna ask for it there. And I said, "Well, I've got my MBC—I've got a certification card from my own company, and I've got my old Scripps card, but that is not certification card."

Paul: You had it with you? Your Scripps card?

Chuck: Yeah, but that wouldn't work. So they wrote—and I've still got it, the yellow notebook paper like that [indicates]. [Jim] Stewart wrote, "Please let Chuck dive, he is a good diver." And then he signed it with his NAUI instructor number. Everyone there was an instructor, so they all signed it with their instructor numbers and we went on to Buccaneer Dive Resort or whatever it was called and sure enough, when we got there they lined everybody up the first day and the divemaster was asking for our certification cards and stuff. So I just let everybody go in front, and then I handed my note from my mother—

[Laughter]

Chuck: --and he looked at it and I said, “I'm sorry. But I’ve been diving for a long time.” I think about that time I had something like 10,000 dives logged. 10,000 hours. And they said-- this guy says, “Well, I don't know who any of these people are, but if that is really their NAUI numbers…” And Stuart was like NAUI number twenty-four or something like that. He said, “I guess you are okay.” So they let me go.

Ashleigh: So that is how you got “certified”?

[Laughter]

Chuck: Well no, but that was the first time I had ever been on a “recreational dive”. First one. And I had a bunch of camera stuff and Rick had camera stuff, and I told Rick, I said there were like twenty-five people on this dive boat. “Half of these people are gunna die!” I said. It was terrifying, I was watching people putting their regulators on backwards, and they were talking about this being, you know, their fourth dive and that all they had been diving on before was a quarry in Michigan or something like that. And you're going oh my God! And they’re taking us out, you know, the first dive of the day is you’re making an 80 foot wall dive and they’re going to pick you up half-mile down the drift and, you know, “These people are not going to come back!” Then they did but the dive master was so happy he had to less to worry about because we just went off in a different direction but man, it was pretty scary.

Paul: Just the early stuff just to get it because you’re the only one we’re talking to. You were working and qualifying, and you are friends with Greg, and so you are interactively saying you were screwed, what was your idea that early diving science? Where they all fascinated with quantification or are they asking interesting questions?

Chuck: It was all of the above. There were probably about fifty-seven, something like that. It seemed like there was a big push suddenly to do things and try to do things quantitatively. I think it was the first real attempt to take those things that we had learned in ecology from terrestrial ecology and apply it in the Marines. All of a sudden you had things being discussed at random, quantitative kinds of efforts. It suddenly seemed like in that period of time in the kind of late 50s we were suddenly seeing that being used out here in the events and people really trying to do things in a quantitative fashion. I think part of it, I always used to tell beginning divers that I was training, it seems to me that it was easier to try to sign us to die than to take a diver in. But that first year when you learn how to dive, it seemed that you would never get any science out of the first year. You were still worried about life-support systems, worried about gear and stuff like that. It takes a while before you are relaxed enough and confident enough in your skills.

Paul: And the people were learning to swim at the same time, but most of us as I recall were snorkeling, we were comfortable. We did not have the learning curve. Jim used to say and you repeated it, I can teach a good scientist to come back alive, but you can't get a diver and teach him science. I think it's the reverse now.

Chuck: One of my pet peeves is that we have so many nonprofits and volunteers and there are million of them. That are doing science. And it is garbage. They get so much funding for some of the stuff your and I have to embarrassingly say that we because of contractual obligations to utilities, we have to support some of these groups. And we have to review the data and we are responsible for the data and every single month we pull things out of identifications that and the with specific species, and deep water, I have no idea where they come up with these names, and you train them, but then those people could not make it this week so they come in and she saw one of those on Discovery Channel last week and it looks just like them and nobody knows. Taxonomy has gone by the wayside and you look at photographs and you are right, nobody supports, we had to train our own these days. As somebody could identify worms. Micro crustaceans.

Paul: A lot of things are done in terms of safety, do you think things are safer now than they were in the 1960s?

Chuck: No. Do you think they are?

Paul: No. I remember people would get action and scared, and so white, but we were scared and so careful.

Ashleigh: There are so many researchers even here at Scripps that don't have that connection to the ocean growing up. I was even in dive class with people I was uncomfortable with. You weren't looking, help I don't get buddied with them. Were you studying science in college when you are at Scripps?

Chuck: Yeah.

Paul: Who taught your classes? What classes did you get?

SPEAKER2: I was at San Diego State. There were, I can run brought them. People that I think made a difference as far for me, were a fellow by the name of Hunsaker, that was an animal behaviorist. I started out with animal behavior. And I had taken graduate and undergraduate lasses from him. Fish taxonomy, I had a terrible fish taxonomy instructor. Marine invertebrates, I had Wilson. A young guy that had just started. I can't remember his first name. He was good.

Paul: There was a class?

Chuck: Yeah. One that caused me the most traumatic experience of my life, I had a fellow in his first year of teaching and the class was set up and I'm thinking, "This is great!" We had a regular classroom to learn all of these invertebrates and stuff, and we all had to do a project. We had to get up, write a proposal, and present that proposal to the class. And then we had to get progress reports throughout the class. And we had to give a final report, present it. There were no quizzes, you just worked on your research project the entire time. Your entire grade was based upon your report, and the final exam. The final exam was oral, and it was to be *three hours*. You had to schedule when you'd come in and take it. And he gave us in advance examples of the types of questions that he was going to ask. We had to choose one animal group to specialize in and he could ask us anything. Anything! And one of the questions he was going to ask was like this, he'd tell everybody he was thinking of a marine animal, what is it? And you had to ask questions that he could answer only by yes or no. To figure that one out. I can remember my study, just covered with this giant key.

Ashleigh: You had to memorize everything.

Chuck: I went and turned in my report, and did all that stuff. I went in for my final exam and fortunately or unfortunately, a mix of both, all of my professors usually new that I worked out here or was working for the fishery services. Sometimes it was helpful, most of the time it was a detriment because you had to be one lecture ahead of everybody else. You would get the question. Anyway, this guy immediately starts out with I am thinking of a marine animal, what is it? My brain went blank. Absolutely blank. I never had that happen. If you would ask me my name, I just sat there in an absolute lock up. And then, because I already knew everything that he had taught in class before I got there, all of these years identifying animals and all of a sudden I just started remembering. Just lines of names coming out of my mouth, it was just like every thing I had ever heard just coming out like a machine gun. And this horrifying look on his face, his eyes were just shocked. This stuff was just pouring out of me and then he stood up and said you are just guessing, you're just guessing I'm not listening. He covered his ears and I'm still spewing out. And he finally got me to stop. I was a mess. And he talks to me about other things, what are we doing, and I still was not recovered. And then we walked over to the Commons and he bought me a cup of coffee, and we walked around. He took me back. And I got an A in the class, I passed it but it was the most traumatic experience that I ever had. I never had that happen again.

Paul: Over the years that I did exams for graduates but students about the percent would freeze up and usually it was really hard to tell when they are stupid. You kind of have to know them. In order to separate that. You don't want to flunk somebody for freezing up and you don't want to keep somebody who is genuinely a bad student.

[LAUGHTER]

Paul: We might be at the end of our science here.

Ashleigh: That’s a great time to wrap up. This has been really fun!