

IMPROVISATIONAL THEATER-IN-THE-ROUND: HDTV Broadcast of Sea-going Research

Beyond memory, humans have gone to sea. Traveling from one place to another, some attempting to escape, some to find food, others to look for trade, lately pleasure is a goal, in some cases the survival challenge is everything. And for the past 150 years, a small fraction of our population goes to sea for long periods of time simply to find out how the oceans work. All who come to sea, those who survive, know that the one constant at sea is change. And survivors become improvisers.

Early morning, the surface of the ocean is placid, the breeze caresses me, the waves are gentle, I become lulled by ancient rhythms. Then, as if by whim, late that day the same ocean becomes a raging, impersonal force pounding every weakness in the little cocoon of survival we call a ship. Reactions vary among sailors. Some pray fervently for good weather, others shrug, saying 'What happens, happens'. The best are prepared for the worst and enjoy the rest.

There is something deeply spiritual about working day in and day out in the deep ocean, no land in sight. The horizon, the stars, the clouds, the winds, the animals, the waves, the other sailors/scientists, are constant companions. The struggle to accomplish some goal in the face of overwhelming, if inconstant sea power, is common to all who enter this water world. Knowing that sailors for centuries faced similar power, we also know that some have lost, many survived, but all are changed.

On a research vessel deep in the open ocean, only water lies in every direction. Unlike it is on land, the horizon is a perfect circle. Immersed in a temporarily close-knit ensemble of colleagues, long-time friends, and new shipmates, each of us struggles to grasp some piece of our own truth. That quest can vary widely. Some of us want to understand how the world works. And where we fit in to it. Some worry about being seasick. Some want to know how life originated on earth?

Others focus on the inner workings of plate tectonics. Some want to know if their family really misses them. A major question for me is how plate tectonic deformation is linked to life without sunlight? Others want to know the forces that drive climate change and how they interact? A major recurrent question among scientists: will my equipment survive? A major question is how often, when, and why do phytoplankton, grass of the ocean, bloom? What is the full diversity of life forms that live in the ocean? Is there enough coffee left to finish the cruise? What is for dinner tonight? Can we extract new medicines from the ocean? Did my grant get funded while I was gone? What is the ultimate role of the world's oceans in our lives? We scientists are very human.

Poets and scientists alike are powerfully drawn to the sea. Why? In part, because it is our nature to ask questions, to seek answers, to explore. We design experiments or poems that might illuminate some piece of the great mystery - how it all works. **That**, of course, is the grand challenge – How do the myriad pieces of a planet-scale oceanic system fit and function together? Can a small change of a single insignificant component somewhere result in devastating unpredictable, downstream consequences, like a tsunami? Or a magnitude 4 hurricane? Or a cholera epidemic? Can we identify the tiny changes that presage destruction. How does it all fit together? Some of us search for answers by coming to sea. Most of us on board this cruise have been here at the Juan de Fuca before, some many times. A number of us love this life with an

inarticulate passion that might embarrass us if we honestly expressed it. And then, of course, we all talk about how great it will be when we get back to shore.

The camaraderie, the laughter, the hollow look of sleeplessness, the exhilaration, the exhaustion, the sheer joy of a stunning sunset, the flare of someone's temper, the play of northern lights, a series of massive waves breaking in the shriek of the wind... It is something I do not want to live without. The changes invoked, happen within us, in response to the never-ending change in the sea around us. We have always the need to improvise. Extensive plans, with elaborate timelines, calendars, and lists, constantly reconfigured to confront the unknowable in our quest to understand the unknown.

Addressing our questions, designing new experiments, continuing measurements set in motion long ago, imagining novel designs guided by earlier failures, working at the edge of knowledge... it is as if we operate along the boundary between light and darkness – between knowledge and ignorance. We deal with what we think we know, and seek to explore that which we don't know. There is not much known about what's left to be discovered...about our world, about ourselves.

There is no map for exploring the unknown. These are some of the challenges we gravitate toward when we come to sea to do our research. The potential to make a stunning new discovery never before seen, drives us from within. The 18 hour days, the sleepless nights, the terrible weather, the tensions, the failures, all fall away like the outer petals on a beautiful rose when it happens and we stare at something beautifully new

We are strongly moved to share this beauty. And we offer it to many of you this week with the HDTV Broadcast that will happen Wednesday and Thursday at 2:00 pm West coast time. The advent of stunning new technologies like live HDTV, Satellites linkages, the Internet, allow sea-going scientists to bring these experiences into laboratories, classrooms and living rooms across the world. We oceanographers are entering a much broader stage than most of us are accustomed to. It extends far beyond the familiar, warm bounds of the ship we call home during a cruise. In taking this step, we must recognize that producing, directing, participating in, sharing and watching the process of at-sea research, is not something a playwright can easily script. It will happen at the whim of the environment we are immersed in. We can, and we do, plan extensively, but we constantly improvise. As I write this, the wind outside is blowing 30 knots outside, the waves are 10-12 feet high, and growing. We cannot go into the water with our instruments. This is not a world for happy commuters, who become stressed out by missing the 7:16 into the city.

We approach this idea of a live broadcast, with some temerity, but minimal hubris. We recognize that anything can go awry, much already has, and we have dealt with it (another story). We hope all of you realize we are at sea in an improvisational theater-in-the-round. The ultimate director is not a Shakespeare. It is the ocean. The horizon at sea always delivers surprises. And it is worth remembering that we are not only facing whimsy of weather, but Law of Murphy. Research at sea will always be a story. But if we are doing it live, the ending will be perpetually rewritten, even while it is happening.

If science is music, sea-going research is jazz. I invite you to the concert.

John Delaney
Co-chief Scientist
VISION'05 Cruise