**Long Core Webinar- Notes – Version 2**

Committee of Volunteers: Clare Reimers, Tim Herbert, Larry Peterson, Mitch Lyle, Paul Baker, Sandy Shor, Jim Broda.

**Comments since webinar- as of 19 Feb.**

| Date | Person | Comments | Notes |
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| 2/13 | Paul Baker | Why the long coring facility was not planned as part of the new Ocean Class, (AGOR27&28) ships that are being built. | Ask Al Suchy |
| 2/14 | David Lea | The Long Core facility is superior to other options and therefore if resources were not limited, we would undoubtedly want to maintain such a facility.<br>Part of the reason that proposal pressure might be low is that PIs know it is challenging to obtain funding to do mainstream paleoceanographic research; the prospect of trying to obtain funding to analyze one or more 40 m cores is daunting.<br>The decision to move the LC facility could be viewed as a tradeoff we make now. I assume this would mean reduced funding for core research, versus having the infrastructure available for future discoveries. If this is correct, then it would be important to have as much community input on this choice as possible.<br>The argument for maintaining the LC facility ultimately comes down to the science rationale. What science requires LC today, and what science can we envision in the future that will require LC? Community needs to identify and clearly articulate the science rationale.<br>If we do not transfer the LC facility, it will likely put future US researchers at a disadvantage in competing with the best ocean paleo-science internationally. In the past, the availability of MD cores has provided a significant advantage to European researchers.<br>Without the LC facility, it will limit the scope of future paleo research that we might not be able to envision at this time (i.e., new problems, new locales, new approaches).<br>One can envision important partnerships now and in the future between US scientists and scientists in developing countries that could leverage the LC facility. If there was a mechanism whereby a financial partnership could be formed, it might aid in the funding of the LC facility. | |
| 2/14 | Nick Pisias | In studying the use of the R/V Langseth for long coring, last year the OSU coring group supported the first major piston coring (maybe the first piston coring ever) on the Langseth. We found the ship to be very limited in supporting a big coring operations. Labs are very small and the waist deck is very wet and almost unusable.<br>On UNOLS ships the present length limitation to taking large diameter jumbo piston cores is not the length of the ship or length of the core that can be rigged. The limitation is in the 9/16 3x19 trawl | |

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| | | wire used on the UNOLS fleet. If we could get a small diameter synthetic winch system the length of standard piston cores could be greatly lengthened and help satisfy some of the needs of the scientific community. | |
| 2/15 | Bill Curry | The suggestion to increase the length of conventional UNOLS piston cores by purchasing a synthetic rope-winch combination is a good one, but will need some fleshing out. In the attached report for a long core workshop we held at NSF in 2001, we presented model results showing that piston core penetration is a function of core weight and sediment shear strength. At the time our conclusion was that conventional UNOLS piston cores would be hard pressed to penetrate beyond 20 m "except in the sediments with the lowest observed shear strengths. Core weights of at least 10,000 lbs would be needed to increase routine penetration and recovery to 20 m." | |
| 2/15 | Bill Curry | If you increase the weight of the core, you would increase the penetration but at the cost of stretching the synthetic rope. A stronger rope is key to avoiding sediment disturbance from stretching. The higher the weight of the core, the larger the diameter and breaking strength of the rope and the bigger the necessary winch. When the winch gets too large the system is no long easily portable, making it difficult to get to and from ships at distant ports. | |
| 2/15 | Matt Hawkins | Agree the Langseth's wet decks are a big problem. Other arrangement details can be solved rather easily. Part of our "next steps" would be to evaluate what improvements the sponsoring would make to the ride and wet decks. They solve a number of other stability/tankage/trim issues that we previously didn't fully appreciate. It's one reason why I'd like to move ahead with this next bit. We need to know. | |
| 2/15 | Nick Pisias | The big challenge for the Langseth remains the limited lab space. PI's now require much more during piston coring cruises that in they did 20 years ago. Pore water chemists and microbiologists need space to set up labs for processing cores (multisensor tracks, splitting, describing and photography) as well as space for specialized laboratory equipment. On one cruise we had two sensor tracks, three autoanalyzers and space for opening and describing cores all in the lab. These types of operations would be very difficult with the present lab space on Langseth. | |
| 2/15 | Nick Pisias | Bill Curry is correct about issues if we added weight to the existing jumbo piston corers. But adding weight is not the issue. In the equatorial Pacific on the Carnegie Ridge, Cocoas Ridge, Nazca Ridge, for example, we can recover 20 to 25m cores without much issue on ships that let us rig 70 to 80' of pipe. But if you go into deeper waters around these shallows, the added wire weight from the 9/16 inch wire begins to cause problems with excess pullout tensions. In the W. Pacific in much deeper water, the problems get | |

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| | | even worse. So by going to a synthetic line that has no wire weight we could easily get 5-6,000 lbs more pullout without making other changes. In short our problem is not getting cores into the sediment it's getting them out.<br><br>On coring from the new Alaska ship Sikuliaq, piston coring will be very limited. This ship has 100' of starboard rail but has no system for handling equipment over the side of the ship. All coring and other operations must be done through the stern A-frame. OSU coring group has been asked to test jumbo piston coring systems off the Sikuliaq this winter. We will be using the ice breaker Healy track system that limits cores to only 40'. Also, we need to work out how coring with piston corers will be worked out with multicoring operations. Why was Sikuliaq not designed with over the rail operations in mind? | |
| 2/15 | Clare Reimers | There is broad agreement that Long Coring system is a unique and very valuable sampling tool for the paleooceanographic community and researchers interested in the subsurface biosphere. The main question is what is the best plan to make it available after the retirement of R/V Knorr from the UNOLS Fleet?<br><br>Ideas under consideration:<br><br>a) Re-positioning on the Langseth<br>b) Transfer to a commercial or foreign vessel<br>c) Some commercial operator acquiring the Knorr from the Navy and leasing it for long corer ops<br>d) No immediate re-positioning action but start the planning of the next generation UNOLS Global vessel that could carry the Long corer (this could result in a 20 year hiatus in Long coring). | |
| 2/16 | Paul Baker | A few recommendations have surfaced.<br>One is that the design and realization of all new UNOLS ships, both the AGORS and the smaller vessels, needs to incorporate the possibility to rig long jumbo piston cores or the WHOI long corer.<br><br>We should make recommendations for how to increase the long-coring capability of our existing facilities.<br><br>We should have the strong/light synthetic rope and appropriate winch on our most important coring vessels in the UNOLS fleet. That | |

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| | | would seem to improve JPC core quality, allow coring in deeper water, and prevent major stress on steel rope and winches during pullout.<br><br>We will have to make the third recommendation and right now I have to say it sounds like the handwriting is on the wall--it seems very unlikely that we can put the long core on the Marcus Langseth. Right now, given the budgetary climate and relatively low proposal pressure, I see few good options for the WHOI long core. I think Clare's point (d) is most realistic, although I really think that the two new AGORs 27 and 28, should have had this capability. | |
| 2/17 | Mitch Lyle | We need to make it clear that piston coring is a key component of marine geology/paleoceanography/deep biosphere/geochemistry programs. One major issue with the lack of proposal pressure for the long core facility has been the lack of communication to the community--the same thing happened with multichannel seismic, and resulted in the MLSOC working to build up a user base. Recommend some mechanism to drum up coring proposals. We make the case for LCF. A commercial charter is going to be the most expensive and least satisfactory option. There is a reason we have oceanographic research vessels, i.e. lab space for immediate work on core material, and ability to do other oceanographic activities in tandem. Transfer to a foreign vessel is a concern, unless NSF is willing to put significant money into developing the proposal structure for use of the facility and guaranteeing access to use it. Issues with Marion Dufresne access were why the LCF was built in the first place--we should get Dick Poore's perspective on this. Waiting 20 years for a facility is essentially to declare LCF dead. In terms of selling then re-leasing Knorr, there begins to be issues on safety that would have to be faced, and the loss of lab space.<br><br>The real options are to refit Langseth for the LCF or to refit the jumbo cores so that they get as long cores as possible and have adequate winches/wires so that they can work without high risk of loss below 3 km water depth. My recommendation is to spec out costs for both. Having cored off Langseth, it holds station well and is fairly stable. It does have a wet work deck. | |
| 2/17 | Paul Baker | Best option for retrofitting the ML for the long core seems to be addition of sponsons for stability, a job that would cost about $6M The Marcus Langseth as a Multi Channel Seismic platform is actually having all the same issues as the long core--there is very little proposal pressure for MCS. So all the same comments made by NSF regarding the long core are also being made about the use of the ML for MCS. How do we preserve the ability to do MCS, take long cores, or undertake deep drilling? In many ways these are existential questions related to the whole survival of marine geology science. | |

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| 2/17 | Jim Broda | Building a portable synthetic rope winch is not a trivial issue. A traditional single drum winch will simply not do the job. The slippery properties of the hi-modulus rope and the impact of pullout forces on the drum at the moment of extraction of the core demand and isolation of the main drum from the working load. A traction winch is required. Secondly, due to Coast Guard regulations, strengthening of the rope to a high level will have a tremendous impact on the foundations of the winch, and any overboarding equipment would have to be significantly upsized to match the break strength of the rope. These special foundation areas and the related hardware would winch make portability of the system a serious challenge.<br><br>2. Nick brought up the Sikuliaq and its limitations, and I think he could confirm that even if a new stronger overboarding system were available, rigging and launching significantly longer JPC cores [greater than 25 meters] from the existing ships in the fleet [other than Knorr] is not really practical or possible.<br><br>3. Bill pointed out the results of our studies while developing the Long Core related to weight of corer, resistance to rope elongation to insure core quality, and deployment strategies as they relate to ship stability when the operational forces are encountered. Tackling these issues anew would result in a system and installation arrangement similar to the one were struggling to sustain.<br><br>At this point in time, if the will of the community agrees, our effort should be focused on finding a way to retain our current capabilities, however novel the solution may be. | |
| 2/18 | Mitch Lyle | There has been major pressure against IODP, some with reason, about the expense. IODP is not very nimble and cannot supply more than part of the subsurface needs to the community. And, that drilling needs site survey which requires coring and MCS.<br><br>It might be worthwhile to get in touch with the US Science Advisory Committee for IODP, http://iodp-usssp.org/committees/usac/members-subcommittees/ and try to coordinate across MGG. Anthony Koppers is chair. | |
| 2/18 | Joe Stoner | We are looking at an "existential questions related to the whole survival of marine geology" as MCS, long cores and drilling are all complementary and necessary pieces of the same marine geology puzzle. If we are to address marine geology/paleoceanography/deep biosphere/geochemistry programs and even paleomagnetic and ice sheet history programs we need these capabilities and the long core is really a game changer. We need to find a way for this capability or at the very least something similar to continue. | |

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| 2/18 | Mitch Lyle | Not familiar with the discussion about retiring Knorr, so would like to hear what the issues are about keeping Knorr as a LCF boat. What about alternating tie-ups and campaigns?<br><br>The seismic issues are relatively minor. Scripps has a portable 48 channel hi-res seismic system that could be used on the Knorr, and all that Knorr would need is either a built-in or portable compressor to make the high-res system operate.<br><br>As for selling Knorr and using as needed, we sort of did that with the Gyre, selling it to TDI Brooks (http://www.tdi-bi.com/) and it is theoretically possible for us to lease it out. We should probably explore that option as well. | |
| 2/18 | Tim Herbert | Much of our paleoceanographic emphasis is moving to continental margins for reasons of high resolution and really exciting science is there- mingling of marine and terrestrial proxies, intermediate water chemistry, etc. To do this work will require close relationships with international partners as you move so close to shore. But I can't imagine being in a strong position to work with colleagues overseas if I come to them and say "I've got an opportunity to write a proposal (that may or may not get funded ) to be part of a French or German coring cruise". Why should they want to partner with me in that case? The ability to offer the best long coring system in the world, which we have right now, versus tagging along with another nation's capabilities, is radically more competitive.<br><br>Having to rely on foreign vessels will also favor the handful in our community with strong ties to particular foreign scientists who have a large say in the operation of their nation's coring program. Having a facility courtesy of UNOLS obviously levels the playing field and encourages proposals and science from a much broader base of the marine geoscience community.<br><br>NSF is encouraging this dialog on long coring is a sign that the Foundation is willing to look at things in addition to proposal numbers to gauge how the community feels and what is necessary to keep our science at the cutting edge. This really is a time for pro-active work between the Foundation and PIs. | |
| 2/19 | Larry Peterson | Some of the lack of proposal pressure we heard about from NSF can be directly traced to the loss of momentum within the IMAGES (International Marine Past Global Changes) community and the hiatus in activities in that program. Many think IMAGES is dead | |

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| | | though in fact it is not. Though NSF did support quite a few US participants on IMAGES cruises over the years, it was becoming increasingly difficult for the NSF folks to do so for several reasons. First was simply the perceptual problem of sending funds to support shiptime on a non-US vessel at a time when it was getting harder to support our own US fleet. And second, and perhaps even more importantly, IMAGES never had a rigorous procedure for scientific evaluation of campaign objectives – it was typically more a case of picking areas to core based on who could bring money to the table.<br>A new Science Plan for IMAGES(2) has been written and internally approved (though not widely distributed yet) and we were just informed last Friday that a workshop proposal submitted to the ECORD MagellanPlus program about a month ago has been funded. This international workshop, to be held in Cambridge in either late September or early October, I think this bottom up, self organizing community element has been missing the last few years and that this, at least in part, is reflected in the low proposal pressure for long coring using the US system. In this regard, a revitalized IMAGES(2), if it gets off the ground, really has no downside if it actively helps to promote science that requires long coring. This can only benefit our situation here in the US community.<br>In the new IODP each of the major international partners will have its own Facilities Governing Board that controls scheduling of the individual platforms (i.e., JOIDES Resolution, Chikyu, and MSP's). The Facilities Governing Board for ECORD will thus have full flexibility to select and schedule platforms. So it could be the Marion Dufresne or it could be a US vessel with our own long coring system my long diatribe is meant more to be informational and mainly bring you up to date on what has been happening with IMAGES. But it concerns me greatly that we are facing the potential loss of one of our most valuable capabilities at a time when I see clear indications that interest in long coring and the type of scientific questions that can only be addressed by high resolution studies of long, high quality, wide-diameter sediment cores seems to be growing again. | |
| 2/19 | Joe Stoner | It is clear there is significant scientific justification, a clear political advantage to the US having long core capability, a US and international need that coming out with IMAGES(2) and IODP and one that would likely grow in the US with education and more efficient scheme, than NSF cruise proposals that acts as barrier to newbies and new ideas, to access the long core capability. But with the retirement of the Knorr (anyway to delay?) and the lack of other suitable ships, we are kind of between a rock and a hard place, so not sure where to go? | |