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TO: Dr. Margaret Leinen, Director, Scripps Institution of Oceanography

FROM: Dr. Arthur J. Miller, Head, Oceans and Atmosphere Section

RE: Researcher Hiring Plan for the Oceans and Atmosphere Section

The OA Section has a tremendous need to transition a large number of creative and productive early-career scientists into new independent Researcher positions. In an ideal world, we would jump at the chance to hire all this talent by creating PI positions for every one of them. In the realistic situation that we face, with 25% institution support being the dominant limiting factor, we hope that you would consider opening more than one, perhaps two or even three, Research positions considering not only our Section needs but our institutional directions as well.

Being tasked here with developing a Researcher Hiring Plan for only ***one*** new Researcher Open Advertisement, I called a Section meeting on October 27 to discuss **potential fields** to target and to hear about **individuals** who might be suitable for the appointment. I also sought input on how to **prioritize** the list of proposed research areas. Because the metrics for prioritizing are so orthogonal, the OA Section Academics who attended the meeting suggested that I should gather information and prioritize the hiring plan rather than trying to achieve a section-wide consensus.

I decided that the best way to proceed was to first meet with each individual SIO-based candidate to learn of their expertise, accomplishments, creativity and leadership potential. Second, I considered the programs or research areas that were proposed by various PI's to be targeted in the open search. Additional factors that I considered involved the faculty FTE's that were recently filled (Sustained Observations, Polar Science), are currently open (Acoustics) or are slated to be our top priorities for next year (AGAGE, GDP). Finally, I tried to view the whole package from the OA Section's and the Institution's perspective. I weighed the potential for expansion in OA research areas, gaps that need filling in our present OA research portfolio, and requirements for maintaining SIO's leadership roles in sustained global ocean/climate observation. For the latter, in addition to OA Section interests, there are additional institutional priorities and value to the oceanographic community to be considered.

Eight distinct research areas (or programs) were proposed for the open advertisement for a new Researcher hire. These are: *Acoustics, AGAGE, Argo, Data Assimilation and Modeling, Global Drifter Program (GDP), Ocean Mixing, Polar Science, and Sub-seasonal to Seasonal Prediction (S2S)*. The following represents my prioritized ranking based on the criteria listed above and a considerable amount of important input from various section members.

First Priority: **Data Assimilation and Modeling** is an area that SIO has had a long-running interest since Bruce Cornuelle's arrival in the early 1980's and continuing in Detlef Stammer's short-lived presence on our faculty. We face an impending issue in loss of expertise since Cornuelle may be nearing retirement at the same time that the demand for these methods is increasing. There are several programs that could greatly benefit from a hire in this area, most obviously SOCCOM, but also including CW3E, AGAGE, and the Polar Center, especially if the modeling includes both physical and biogeochemical (BGC) components in the ocean, ice, and atmosphere. ***Dr. Matt Mazloff*** would be a prime candidate in an open advertisement for this position. He particularly impressed me with his wide-ranging research accomplishments, his vision for the future in connecting physical sciences with BGC in novel ways, and his demonstrated leadership, independence, and mentoring of both graduate and undergraduate students. He is well-funded within the high-profile and cross-disciplinary SOCCOM program, which features Mazloff's "Southern Ocean State Estimate" as one of its centerpieces. He collaborates with numerous PI's, scientists, students and staff here in the OA Section, across SIO, and in other institutions. He is currently being courted by Oregon State University for a faculty position, so there is an urgency for retaining him because of the central role his data assimilation and modeling plays here in SOCCOM.

Second Priority: **Large-Scale Sustained Observations with Deep Argo** has vast potential for changing the way we think about the deep ocean through robotic sensor innovation and deployment that leads to new long-term observations in physics, biology, and chemistry. Deep Argo will continue the transformative impact of the Argo Program, extending Argo observations below the present 2000m limit of Argo to the ocean bottom, closing the ocean's heat, freshwater, steric sea level, and carbon budgets. Argo is one of Scripps' signature large-scale observational programs. We may potentially lose our leadership role in Argo when Dean Roemmich retires. We face an uncertain future in this program unless some of our early-career talent can be groomed into becoming our next generation of Argo scientific leaders. Prof. Sarah Purkey clearly provides us with some of that leadership potential for Argo. But we already have another scientist who is leading the development of Deep Argo (as an Argo co-PI) in very impressive ways. ***Dr. Nathalie Zilberman*** has remarkable leadership skills and interesting plans for Deep Argo science in the coming years. Purkey and Zilberman together would make an energetic team for fostering the future of Argo and Deep Argo here at SIO. The institution should recognize this great opportunity for solidifying our role as scientific leaders of this revolutionary program by running an open advertisement in this research area.

Third Priority: **Polar Science** would be an excellent area to run an open advertisement in order to help catalyze the new Polar Center. With the future arrival of Prof. Fiamma Straneo as a sea-going observational leader, the center would benefit from an infusion of talent in theory and modeling of the ice-ocean-atmosphere system. ***Dr. Till Wagner*** has some extraordinary skills and creative ideas about how to fill gaps in polar research here using combinations of theory and models that address key scientific questions in polar climate feedbacks. He is also eager to develop sea-going and ice-going activities to obtain new observations. His enthusiasm for science is contagious, which is evident for anyone who attends the Climate Journal Club that he organizes for our Ph.D. students. He would be a prime candidate for this position.

The remaining five research areas are unranked and listed **alphabetically** with a short discussion of each.

Acoustics: MPL has recently secured large multifaceted, multiyear Navy-funded research projects that require additional Researcher-level support. These programs provide both an opportunity to do basic research and to propose additional research programs that benefit from this effort. There is funding to support a new hire for the first few years as well as provide a base for that person to grow their own projects. This year's OA Section Faculty FTE is targeting an experimental sea-going ocean acoustician who will also be involved in these new programs. I believe it to be prudent to wait until this new hire is in place before opening a Research appointment in this area. Project Scientist appointments should be adequate in the near-term.

AGAGE: The Advanced Global Atmospheric Gases Experiment is a vital cooperative research program to monitor and assess the levels of GHG and stratospheric ozone depleting substance emissions around the globe. Scripps has a high-profile leadership role in it that absolutely needs to be maintained by a targeted faculty recruitment in our Section, and hiring an AGAGE leader to succeed Ray Weiss will be our top priority in the next cycle of Faculty Recruitment. While the search for a faculty AGAGE position would be directed more toward modeling and interpretation, a complementary Researcher hire that targets the AGAGE experimental side would create a powerful in-house combination at SIO. ***Dr. Jens Muhle*** currently plays an instrumental role here in the direction and funding of the AGAGE experimental work and he would be an ideal candidate for a search with this focus.

Large-Scale Sustained Observations with the **Global Drifter Program:** The GDP is highly valued as one of our oceanographic community's cornerstones for sustained long-term climate observations. It serves a vital role in many aspects of climate monitoring, diagnostics and forecasting. After the passing of Peter Niiler, we were fortunate to have Luca Centurioni here to step up to assume a leadership role for GDP. His remarkable abilities have resulted not only in saving the GDP at SIO but in developing burgeoning new expansions of the research. The high-profile leadership role of Scripps in the GDP clearly needs to be maintained by a targeted faculty recruitment to succeed Niiler and this will have high priority in the next cycle of our faculty hiring plan. ***Dr. Verena Hormann*** currently leads many aspects of the ocean robotic technology development in the GDP. Her energetic leadership skills and productive scientific creativity would be better utilized as an independent Researcher who would help the GDP continue to grow as an influential scientific enterprise.

Ocean Mixing: Sea-going observations of ocean mixing is one of the trademark Scripps activities, with several scientists here already actively engaged in that influential field. ***Dr. Amy Waterhouse*** has been a co-PI, a creative leader, and a student mentor here at SIO for several years. She has developed into one of the major players in ocean mixing, including being a lively contributor to the Climate Process Team on Ocean Mixing (lead by Jen MacKinnon) and serving as chief scientist on major-funding cruises. She deserves an opportunity to secure an independent Researcher position through an open advertisement in this classic Scripps research arena, where she would fill a unique niche in shelf-slope mixing processes.

Sub-seasonal to Seasonal Prediction: S2S is one of the five themes for CW3E and there is a sharp mismatch between the S2S contributions currently being made at CW3E and what sponsors have already funded. We are at a key juncture with the science community recognizing S2S as a priority, with stakeholders and sponsors starting to look to CW3E for solutions. The old-school "dry-dynamics" meteorology community is now shifting focus to the water applications area that CW3E has capitalized on. Progress and breakthrough advances could come from linking ocean and atmosphere dynamics to the water cycle, especially in the context of Atmospheric Rivers. CW3E could use an independent leader who recognizes the career-making opportunity that this represents. ***Dr. Aneesh Subramanian*** (currently a post-doc at Oxford) has great potential to be this person and he will soon be hired as an SIO Assistant Project Scientist. He has experience in oceanic, atmospheric and coupled ocean-atmosphere modeling, data assimilation, prediction and parameterization, and has already secured numerous funded grants while he was here at SIO.