NOAA Cooperative Institute Recommendations for Continuing the Implementation of CI21

NOAA Research Council
June 2019

I. Introduction

NOAA's Cooperative Institutes (CIs) are academic and non-profit research institutions that, through a cooperative agreement with NOAA, engage in research directly related to NOAA's long-term mission needs that require substantial involvement of one or more research units within the parent organization or other organizations, and one or more NOAA programs.[1] NOAA currently has 16 CIs working across NOAA's mission areas.

The guiding principles for CIs are as follows:

1. NOAA CIs provide a long-term institutional relationship between NOAA and external academic partners to support research directly linked to NOAA's mission, particularly where NOAA has insufficient internal capabilities or capacity.
2. NOAA CIs support graduate education and professional scientific training of a workforce well-versed in NOAA disciplines and provide opportunities for students to interact with NOAA scientists.
3. NOAA CIs promote strong collaborations between NOAA and academic scientists, particularly when groups of CI and NOAA scientists are needed.
4. NOAA CIs provide a mechanism for allowing external partners to address emerging needs and evolving NOAA research priorities.
5. NOAA CIs are competitively established with institutions with outstanding national and international expertise in NOAA-relevant disciplines.
6. NOAA CIs promote long-term relationships at the highest level between university administrators and NOAA leadership.

In an effort to more strategically manage the CI enterprise as a whole, NOAA produced a Prospectus for Cooperative Institutes in the 21st Century.[2] This document outlined recommendations to elevate the capacity and capabilities of CIs to best serve NOAA's mission. Over the past year, the NOAA Research Council and Line Office Assistant

[1] NOAA Administrative Order 216-107:
http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_216/216-107.html
[2] Prospectus for Cooperative Institutes in the 21st Century:
ftp://ftp.oar.noaa.gov/FTPNRC/CI21_Prospectus_FINAL_18Oct2016%20(2).pdf

Administrators have met to discuss how best to implement several of these recommendations.

This white paper is intended to build off of those discussions, making recommendations on how NOAA should both engage in and manage CIs to ensure an efficient and effective enterprise. These recommendations include the optimal arrangement of CIs, how NOAA can use CIs to engage industry, and CI management within NOAA.

II. Optimal Arrangement of CIs

NOAA's current mix of CIs includes CIs that have a geographic focus and CIs with a subject matter focus. Some CI employees are located at a NOAA facility and vice versa (colocation), while others are not. This section addresses the arrangement of CIs to determine what construct will best serve NOAA's mission.

Colocation

Colocation is defined as either CI employees working in federal offices or Federal employees working at CI facilities. However, it should be noted that Line Offices have repeatedly demonstrated the ability to collaborate effectively without colocation.

Option 1: Colocation Required

Benefits

- Colocation enables close collaboration through the substantial involvement aspect of the cooperative agreement.
- Colocation provides access to specialized infrastructure (at either NOAA or the university).
- NMFS is geographically focused and sees a benefit to being physically located near a CI.

Drawbacks

- There are many examples within the current construct where a NOAA Line Office not colocated with a CI has a rich partnership
- NOAA experiences legal challenges and risks when working in a colocated space due to the increased possibility of inappropriate interactions between federal and non-federal employees due to proximity. As with contractors working in a federal space, there are limitations and prohibitions regarding the level of oversight and supervision that a federal employee can have with a CI employee. This is a risk routinely accepted across NOAA and the Federal Government.
- NOAA severely limits the pool of qualified applicants by prohibiting all universities not geographically located within commuting distance of the NOAA facility of interest from being eligible to compete.

Option 2: Colocation not required

Benefits

- This option greatly expands the pool of applicants for CIs, increases the competitiveness, and ensures NOAA will continue to partner with the best qualified applicants.
- Colocation needs can be met through the use of a consortium instead of a single university hosting the CI.

Drawbacks

- Lack of a co-presence of NOAA and CI employees risks a disconnection from the NOAA enterprise and mission.

Option 3: Colocation encouraged but not required

Benefits

- Enables NOAA to choose the arrangement that best fits the needs of the science at the proposed CI. When the benefits of colocation outweigh the costs of potentially limiting the applicant pool, NOAA can choose colocation.

Drawbacks

- As with Option 2, the lack of a co-presence of NOAA and CI employees risks a disconnection from the NOAA enterprise and mission.

Recommendation

The Research Council recommends Option 3. This option allows NOAA to benefit from colocation when appropriate, while allowing for non-colocated CIs as needed to serve NOAA's mission.

<u>Regional versus Subject Matter Arrangement</u>

NOAA's current mix of CIs includes both CIs with a regional focus and CIs with a subject matter focus. Regionally focused CIs are designed to work on specific subjects in defined geographic areas named in a prospectus. Subject matter focused CIs work on research themes under NOAA's mission areas and are not limited in geographic focus.

Option 1: Arrange CIs Geographically

Benefits

- A geographic arrangement mirrors the regional organization of NMFS, which reflects the organization of the Fishery Management Councils that are created by the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

- Regional CIs enable local expertise in certain subject areas (for example, fishery socioeconomics, climate impacts) and conducting outreach in a region.

Drawbacks

- Significant portions of NOAA's work are not regional. For example, global weather and climate models would not be a good fit in a regionally focused CI. Therefore, a solely regional approach could risk inappropriate duplication in CIs.

Option 2: Arrange CIs by Subject Matter

Benefits

- This construct enables collaboration and shared resources across similar subjects.

Drawbacks

- Certain research areas, such as the Great Lakes and the Pacific Islands, have specific regional needs that would not be addressed in this design.

Option 3: Include a mix of CIs focused on subject matter and CIs focused geographically

Benefits

- This option offers flexibility to organize CIs in different ways, depending on the scientific need.

Drawbacks

- This mixed approach does not outline a rigorous method to avoid unnecessary overlap/duplication in CI work.

Recommendation

The Research Council recommends Option 3; including a mix of CIs focused on subject matter and CIs focused geographically. Some Line Offices, such as NMFS, work on regionally distinct ecosystems and see value in the regional model. Other Line Offices, such as OAR and NESDIS, work in scientific areas that span regions, making a subject matter approach more appropriate. Option 3 allows both to coexist to serve NOAA's mission.

III. CIs and Industry

NOAA currently has one CI that includes a private industry as an affiliate member. This section outlines the other mechanisms available to NOAA to engage with industry as part of or through a CI.

All formal work between NOAA and the private sector must be conducted through the means of an agreement. The agreements that can be used include the Cooperative

Research and Development Agreement (CRADA), the Grant, the Cooperative Agreement and the Contract. Depending on the desired outcome of the engagement, each type of agreement offers some advantages and drawbacks. The table below provides a summary of some of the most common considerations when looking at a new agreement.

Financial Award Instrument	Transfer funds to partner?	IP of Partner Protected from Disclosure?	NOAA gains free license to use partner-developed IP?	Patent Rights for new IP	Software and Code Rights	Research data released publicly?	Defined scope of work and deliverables?
Cooperative Agreement/ CI	Yes	No	Yes	University	University Copyright	Yes	No
Grant	Yes	No	Yes	University	University Copyright	Yes	No
CRADA	No	Yes	Yes	Private or Joint	Company Copyright	Yes	No
Contract	Yes	No	Subject to negotiation	Federal	Public Domain	Subject to negotiation	Yes

NOAA's CIs are currently implemented through a cooperative agreement. Cooperative agreements have certain requirements for handling Intellectual Property (IP) generated during the course of the work some of which may discourage private companies from wanting to contribute.

For example, were a company to participate as a consortium partner under the broad CI cooperative agreement, they would receive the same intellectual property rights as the university partners, as conveyed under the Bayh-Dole Act. Under Bayh-Dole, the cooperating entity has the obligation to disclose any invention made in the course of the cooperative agreement and, in exchange, they receive the first right to patent or assert copyright to that intellectual property. If they do not disclose within a specified amount of time, the rights revert back to the U.S. Government. In addition, the U.S. government retains a fully paid up license to use any intellectual property generated for government

purposes. While not specifically defined, government purposes is sufficiently broad to be a potential concern for a private company involved in the partnership.

A private company involved in a CI would likely also need to execute some type of agreement with the university partner to govern how intellectual property, overhead, and other details are managed between the company and the university. Since there are others tools available for NOAA to engage private industry where private industry maintains intellectual property rights, private industry has less incentive to engage with NOAA through a cooperative agreement. The following options present two different ways in which NOAA could engage with private industry in a way that could benefit both parties.

Option 1: NOAA-led Partnerships (university employees would be directly engaged in the work through their existing CI relationship)

Benefits

- NOAA has control over the scope of work, the level of oversight and control, and the ability to dictate funding associated with the activity.
- In the case of a NOAA-led CRADA, any intellectual property created by the private partner is also protected from disclosure and the ownership rights are clearly stated.

Drawbacks

- The private partner is not integrated into the broader R&D community of the CI, limiting strategic input from industry. The private partner would be a NOAA partner and would only interact with CI employees to the extent those employees are involved in a specific R&D project.
- Integrating private sector partners into a CI consortium would complicate the bidding process, create more paperwork, and may eventually result in intellectual property disputes.
- Identifying certain private partners as part of a consortium could actually reduce the interaction with other companies that are not part of the consortium.

Option 2: CI-led Partnerships (university members of the consortium take the lead on bringing private sector partners to the relationship)

Benefits

- This approach allows CIs to engage with a broad range of private companies. CICS-M has used this capability for many purposes, such as education and outreach, feedback, and helping better defining problem statements driving new R&D. This approach works closely with the host

university's technology transfer office, which could be a valuable partner with NOAA's Technology Partnerships Office.

- This construct benefits from the university's existing industry relationships through their corporate investor networks. There is a level of comfort and familiarity between the university and its investors that can stimulate more engagement from industry and enable more active participation in the NOAA CI's mission.
- When a more direct partnership is desired, companies can be engaged through an agreement either with NOAA or with the lead university, as is most convenient. In either case, the intellectual property concerns would be specifically addressed through the individual agreement.

Drawbacks

- NOAA has less control in defining the partnership.

Recommendation

When appropriate, NOAA can emphasize a partnership with industry is desired when a CI is competed and include industry partnerships as a formal proposal evaluation criterion. This partnership can be carried out under Option 2.

IV. CI Management

CI management begins with the process to create a new CI. New CIs can be established through two mechanisms. The first is when a NOAA Line Office identifies new research needs required to meet NOAA's mission that are not being met through existing CIs, NOAA Laboratories or Science Centers, grant programs, or other research mechanisms. The second is when an existing CI award expires.

Under these two circumstances, the Research Council creates a working group to develop a prospectus describing the proposed new CI's research themes, as well as the funding ceiling. The Research Council must then approve this prospectus (if warranted) and forward their recommendation to the NOAA Executive Council (NEC). Following the approval by the Under Secretary of Commerce for Oceans and Atmosphere, a Federal Funding Opportunity is issued to compete the award. Through a competitive process, a CI is then awarded to a university. This award is assigned to a NOAA Line Office.[3]

CI awards are programmatically tied to a particular Line Office, while the Grants Management Division (GMD) provides financial management and holds the approving authority for all NOAA awards. The Line Office CI Programs are set up as follows: Oceanic & Atmospheric Research (OAR) is responsible for 13 CIs, with a Director and, 1

[3] For more information, refer to the CI Handbook to accompany NAO 216-107: ftp://ftp.oar.noaa.gov/lci/Documents/CI%20Handbook%20Dec2013.pdf

- 2 Federal Program Officers (FPO) in addition to 6 FPOs that do not report to the CI Program Director. The National Environmental Satellite, Data, and Information Service (NESDIS) is responsible for 2 CIs, with a Director and 2 FPOs. The National Marine Fisheries Service (NMFS) is responsible for 1 CI, with 1 FPO.[4]

CIs are intended to serve NOAA's mission. However, there is no mechanism for cross Line Office management of the totality of the CI awards. Rather, once the CI is established, individual Financial Management Centers (FMCs, Program Offices or Labs within Line Offices) add funding one project at a time as amendments to the umbrella award, typically without overall programmatic or financial coordination. For any given CI, there is often limited cross Line Office coordination of the R&D and funding that NOAA applies to serve its mission.

This current construct can lead to a mismatch between the intent of a CI award and the use of that CI award. A CI is designed to address NOAA's R&D needs across all Line Offices. However, NOAA is using CIs with very little coordination above the FMC level. This lack of communication and authoritative oversight leads to the following issues that must be addressed:

- CIs are often reaching their originally competed-for and agreed-upon funding ceilings before the end of the awards. For example, a CI recently met its funding ceiling in year 2 of a 5-year award. This CI can now not work on any new projects. This situation was caused by a lack of initial planning across Line Offices on how NOAA would use the award and a lack of coordination between Line Offices on the continued funding under the award.
- There is a lack of central coordinated understanding of all of the projects a CI is working on for NOAA. CIs work on dozens of projects funded by NOAA under a single award, but there is no standard mechanism across all CI's for the primary responsible Line Office to monitor and coordinate the entire award, i.e. to determine and address any gaps or duplications of effort between individual projects.[5]

<u>Funding Ceiling</u>

In the last few years, Line Offices have been providing significantly more funding to CI awards than planned at the time of competition. Much of this funding has come in the way of supplemental Appropriations after disasters. The ceilings are now being reached

[4] For a more detailed description of CI management, please refer to the attached report, *Overview of Current Cooperative Institute Management practices within OAR, NMFS, and NESDIS,* prepared for the Research Council in July 2018.

[5] NESDIS centrally coordinates research at the 2 CIs it manages, but this is limited to NESDIS research and is not cross Line Office. This NESDIS model may be a useful model to follow when designing a process that is cross Line Office.

well prior to the expiration date of the 5-year CI award, as the ceilings have been based on historic utilization of a CI and not taken into account the increased available funding.

GMD has informed the Research Council of the need for the Line Offices responsible for the CI award to enforce the annual funding estimates set during the original competition. In practical terms, the CI Committee under the Research Council is instructed to coordinate a NOAA-wide data call during the first quarter of the fiscal year. In this data call, Line Offices will provide information on the projects they intend to fund at each CI during the upcoming year. Further on April 9, 2019, the Director of GMD and Acting Director of the Cooperative Institutes Program executed a memorandum that requires the establishment of the most reasonable ceiling amount, and then double that amount for the ward. This should eliminate the need for increased ceilings in new awards. Modifications of ceilings may still be needed for remaining and ongoing awards.

CI Management Structure

Option 1: Maintain the status quo; CI awards are managed by the responsible LO designated by the Research Council. This model has no central CI award management.

Benefits

- There are no benefits to continuing to operate under this construct. NOAA provides over $255M of federal funding per year to CIs and this effort must be coordinated across Line Offices.

Drawbacks

- Under this model, there is little coordination among Line Offices and within Line Offices using the same CIs. This has led to funding ceilings being reached prematurely due to Line Offices not adequately planning the research needs that they intend to meet using CIs.
- The current approach lacks monitoring, oversight, and coordination of the CI's research portfolio due to insufficient staffing and support of the CI program, making NOAA susceptible to unfavorable audit findings and reputational risk.
- The current approach does not uniformly facilitate proactive management of awards. In some cases the budget approver approves funding requests with no knowledge of the project. This approach risks CIs with a portfolio of work not optimally aligned to meet NOAA's mission.
- This approach does not follow all of the procedures outlined in the CI Handbook.

Option 2: Create one central NOAA administrative process, which is then applied by each Line Office managing CIs, consistent with direction from GMD regarding funding ceilings enforcement.[6]

Benefits

- This approach gives Line Offices control of the scientific direction of their sponsored CIs.
- This structure improves upon the status quo by centralizing the administrative process to reflect the original purpose of the CI program to work towards the NOAA-wide mission and objectives.
- This option is more consistent with the roles and procedures identified in the Department of Commerce Grants and Cooperative Agreements Manual.

Drawbacks

- This option does not enable true centralized management of CIs which risks sub-optimizing NOAA's mission implementation due to lack of adequate coordination of CI efforts across line offices.
- This process largely exists in the CI Handbook, and has proven difficult to enforce.

Option 3: Create one central NOAA administrative management enterprise responsible for ensuring all programmatic requirements are met for all CIs, consistent with direction from GMD regarding funding ceiling enforcement.[7]

Benefits

- This approach still gives Line Offices control of the scientific direction of their sponsored CIs. The lead Line Office of a CI controls and monitors all funding applied to that CI, protecting the original purpose of the CI and managing across NOAA the awards applied and work conducted.
- This structure reflects the original purpose of the CI program to work towards the NOAA-wide mission and objectives.
- This option enables NOAA to take a consistent enterprise approach to managing CIs. Central management provides upfront coordination to ensure that the portfolio of work at a CI meets NOAA's need. This approach alleviates the current problem of not following the administrative processes described in the CI Handbook.
- This option ensures that information on the financial standing of all CIs is available in a centralized location for accountability, and managed by the sponsoring Line Office.

[6] The specific procedures to implement this option would be developed pursuant to revisions in the CI Handbook.
[7] The specific procedures to implement this option would be developed pursuant to revisions in the CI Handbook.

- This option is more consistent with the roles and procedures identified in the Department of Commerce Grants and Cooperative Agreements Manual.

Drawbacks

- The current levels of staffing may not be adequate for implementation, without additional personnel. This could be ameliorated by using 1% of the total spent on CIs to add two additional FTEs.

Recommendation

The Research Council supports Option 3. Option 3 maintains the current arrangement of individual Line Offices administering CI's while improving upon the current management structure by adding an additional administrative corporate oversight function to centralize the coordination of CIs.

Direction from GMD regarding funding ceiling enforcement has begun to implement elements of Option 3; however, refinement of this approach is warranted based on the option chosen. Under Option 3 the CI Program Office in OAR should be designated as the entity responsible for receiving and managing the data collection about funding status of each CI across NOAA, while the primary sponsoring Line Office appoints a lead to manage the science and the account including the ceiling.

<u>Length of CI Award Agreement</u>

Competition between universities to host a CI ensures the most qualified applicants are working towards NOAA's mission. Under the current arrangement, CIs are awarded for a 5-year period, with a review by the NOAA Science Advisory Board during the 4th year of the award. Based on the results of the review, NOAA can choose to issue a new non-competitive award of up to five years.

DOC policy limits period of performance for financial assistance awards to 5 years. This is in line with the appropriations life cycle - U.S. fiscal law restricts period of availability of each fiscal year (FY) appropriation to 5 years after the FY end.

Option 1: Maintain the status quo of a five year award with the potential of a single renewal for up to five years.

Benefits

- One function of the CIs is to allow NOAA to be nimble in its science needs. Ten years is a sufficient time period to work in depth in a subject area, without extending beyond the time point that NOAA's scientific needs for external partners have changed.

Drawbacks

- The competition process is extensive and time consuming for both NOAA and the applicants.
- Some scientists feel a 10-year commitment is insufficient to make progress on a project.
- The recipient of CI awards perceives the lifespan of a successful CI to be indefinite. This creates a conflict between NOAA's purpose for CIs and the university recipients.

Option 2: Examine an option for extending the award length by allowing two five-year renewals.

Benefits

- There are greater incentives for universities to make investments benefiting NOAA if they have the possibility of an additional non-competitive five-year award.

Drawbacks

- If a university wanted to formally add a new consortium member to the CI entity, the university would need to wait for a new competition. However, the university always has the option to issue a subaward to additional parties who are not consortium members.
- This option would require an additional review, led by the NOAA Science Advisory Board, to determine the appropriateness of the second renewal. Reviews are extensive and time consuming for the university, the review panel, and NOAA.
- This option may reinforce the false perception that CIs are awarded for an indefinite period.

Recommendation

The Research Council sees benefits in both options and gives only a slight preference to Option 1. Additionally, Option 2 would be subject to General Counsel and GMD approval.

<u>Competing New CI Awards</u>

Option 1: Maintain the status quo, consider a new competition every time an existing CI award ends.

Benefits

- This option implies continuity through the status quo when warranted.

Drawbacks

- NOAA is less likely to revise research themes since the competition is based on an existing CI, which exacerbates the existing scientific overlap and science gaps.

- This process suggests to universities and NOAA that there will always be a competition to recreate an existing CI, and the incumbent may have an advantage over new applicants.
- The competition process is very labor and time intensive (takes 12-18 months). The CI program is not sufficiently staffed to administer all of these competitions.

Option 2: Hold a new competition when a Line Office recognizes a need.

Benefits

- This option allows NOAA to be flexible and award CIs based on current and emerging needs.
- Innovation at NOAA can be realized through competition.
- This process encourages NOAA to more thoroughly assess existing and new research needs, and then determine an appropriate financial mechanism to meet those needs or hire federal employees.
- This process removes the perception CI awards are automatically renewed.

Drawbacks

- There could be a potential lag in coverage between old and new CI awards. This option requires NOAA to plan ahead by at least 12 months to minimize a lapse in scientific coverage.

Recommendation

The Research Council recommends Option 2, which offers Line Offices the ability to propose and hold competitions for CIs based on current and emerging needs.

V. Conclusion

The options outlined in the sections above represent the Research Council's thorough review and analysis on NOAA's use of CIs. Based on this analysis, the Research Council has made recommendations with regards to CI optimal arrangement, mechanisms for NOAA to engage with industry and CIs, and the management of CIs. Implementing these recommendations will enhance NOAA's ability to further its mission through work with CIs.

Operating under the recommended options in several instances will require changes to the CI Handbook. Following guidance from the NOAA Administrator on which options to pursue, these processes will be further detailed in an implementation plan.

13-067003

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
OCEANIC AND ATMOSPHERIC RESEARCH
[redacted] MD 20910

JUL 17 2019

MEMORANDUM FOR: RDML Tim Gallaudet, Ph.D., USN Ret.
Assistant Secretary of Commerce for
Oceans and Atmosphere and
Chair, NOAA Research Council

FROM: Craig McLean
Vice Chair, NOAA Research Council

SUBJECT: NOAA Cooperative Institute Recommendations for Continuing the Implementation of CI21

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In an effort to more strategically manage the CI enterprise as a whole, NOAA produced a Prospectus for Cooperative Institutes in the 21st Century.[2] This document outlined recommendations to elevate the capacity and capabilities of CIs to best serve NOAA's mission. Over the past year, the NOAA Research Council and Line Office Assistant Administrators have met to discuss how best to implement several of these recommendations.

This white paper builds off of those discussions in response to your request to the Research Council in August 2018 to make recommendations with regards to CI optimal arrangement, mechanisms for NOAA to engage with industry and CIs, and the management of CIs. This document outlines options representing the Research Council's thorough review and analysis on NOAA's use of CIs. Implementing these recommendations will enhance NOAA's ability to further its mission through work with CIs.

I request you review and approve the NOAA Research Council recommendations described within this white paper with regards to CI optimal arrangement, mechanisms for NOAA to engage with industry and CIs, and the management of CIs.

[1] NOAA Administrative Order 216-107:
http://www.corporateservices.noaa.gov/ames/administrative_orders/chapter_216/216-107.html
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Tracking Number: 13-067003

DECISION FOR THE ASSISTANT SECRETARY

Approval of NOAA Cooperative Institute Recommendations for Continuing the Implementation of CI21

OCT 3 2019

_____ I approve NOAA Cooperative Institute Continuing the Implementation of CI21.

_____ I disapprove NOAA Cooperative Institute Continuing the Implementation of CI21.

_____ I would like to discuss this issue.