

## **V-HubCoPe:** A Virtual Hub for Facilitating Collaborations and Broadening Participation to Address Challenges of Coastlines and People

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**Basic Idea:** A regular physical gathering of researchers, educators, and stakeholders interested in the multi-faceted challenges facing coastlines and people is likely to be prohibitively large and costly. Yet, solutions to these challenges will require participation from diverse viewpoints and integration of expertise and techniques from multiple disciplines. Further, it is vitally important to develop, share, refine, and organize material for education and outreach to a variety of audiences. A virtual hub that facilitates inclusion and integration to form a cohesive community of constituencies in a dynamic, cost-effective and scalable manner is essential to long-term self-sustainability.

**Specific Recommendations:** V-HubCoPe is envisaged as a web-portal with a dynamic membership base (including profiles), and associated method of organization and search of the information on the hub, that has many components including, but not limited to, the following:

1. A CoPe wiki-like platform that is maintained by members of the virtual hub and acts as an organizer of the state of knowledge at multiple levels. As a source of basic introduction, it can serve as a means of outreach to the broader community and public. As a pointer to projects and papers for more detailed information, it can serve as a library of knowledge base and a map of the research landscape for researchers, practitioners and stakeholders.
2. A moderated forum where members can pose questions or challenges they face and solicit community input. This forum will also serve as a means for obtaining pointers to information such as relevant models, testbeds, and data to prevent duplication of efforts. Finally, the forum can also serve as a mechanism for facilitating the formation of teams with complementary expertise in research disciplines.
3. A platform (such as [teachengineering.org](http://teachengineering.org)) where members can upload curriculum or outreach material including media such as videos and demonstrations that may be reused and developed further by other members. The platform would also allow members to share what worked and what did not in their educational and outreach activities to allow further development and refinement of such material.
4. A clearing house for announcing availability and requirements for internship, research experiences and employment opportunities for students and practitioners in this field.
5. An innovation space where industry and other organizations can challenge teams at every level – students, researchers, educators – to identify and implement solutions to specific needs in this overall space.

6. A portal for facilitating distance learning both in classroom and lifelong settings using mechanisms such as webinars from experts that would be difficult or impossible to interact with face to face.
7. A mechanism to allow for development of listservs and other organizational tools so that community members may form smaller communities, possibly allowing for physical meet-ups of interested members in a region, locale, or a discipline.

It is anticipated that setting up of such a hub will require some resource investment; however, the marginal cost of maintenance should be fairly low. The virtual hub could be a model for promotion of similar activities in other countries, and for other complex societal problems, and organized in a way that such virtual hubs can be integrated together in a seamless way. It can also have a mechanism to allow for incentives such as “popularity scores” and rewards/awards to be implemented as a means of encouraging people to continue to engage with the virtual hub and make contributions to the virtual communities within V-HubCoPe.

**Impact:** Coastlines are extensive and problems facing them are inter-disciplinary. Few institutions have the capacity to solve on their own the multi-dimensional problems facing coastlines and people in coastal communities. Forming a community of researchers, educators, students, and stakeholders that are separated geographically and in viewpoints, yet can work together coherently, is vitally important. A virtual hub will serve to broaden participation and to form coherent inter-disciplinary research and outreach teams in a way that would be difficult and costly for physical mechanisms to replicate. Further, a virtual hub will be a means to engage different constituencies at a level that would be comfortable to them. Finally, the virtual hub will serve as both a dynamic knowledge base library and a means to map the research landscape to avoid duplication of efforts and formation of inter-disciplinary teams to enable targeted and effective research.

**Reasoning and Supporting Evidence:** Conventional ways of publishing and archiving information are usually unable to allow for development of communities of researchers, students, educators, and stakeholders. The web, and especially social media, has proven time and again that it is a powerful means of forming communities and facilitating interactions among members by leveling barriers of participation. Even special-interest networks such as Researchgate and LinkedIn in which members grow their own networks, have served important roles in propagating information and viewpoints to researchers who may otherwise not be exposed to them. Virtual Hub is envisaged as a more systematic method of ensuring that information is collected, curated, disseminated, and updated through the formation of a virtual community of members interested in CoPe.

As an example of a dual-direction virtual hub model that accepts community input and provides curated output content, Teachengineering.org is a virtual community of educators engaged in developing, learning, and sharing material for introducing K-12 students to engineering. By lowering the cost of entry to the community members who wish to develop material for use in classroom instruction, and allowing for a mechanism for curation for quality and feedback even after the material is uploaded, it has allowed creation of high-quality material to be used by educators. This broadens participation and development of educational material manifold over other traditional means of similar activities. However, one limitation of this existing model as compared to the Virtual Hub being proposed is that Teachengineering does not include network formation. A true virtual hub would serve such a purpose. It would also be dynamic and change according to the needs of the community members, even as it affects the development of the community geographically and over time.