

NOAA – Cooperative Remote Sensing Science and Technology (CREST) Center

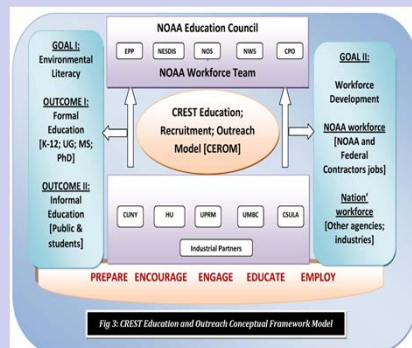
Integrating Remote Sensing Tool to study Oceanic, Atmospheric and Hydrologic Sciences: A Holistic Education and Outreach Model

Shakila Merchant and Reza Khanbilvardi
NOAA-CREST Center, The City College of City University of New York

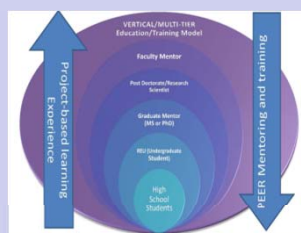
INTRODUCTION

- Established in 2001 and led by the City College of the City University of NY, NOAA-CREST is one of the four Cooperative Science Center funded by the Office of Education's Educational Partnership Program.
- NOAA-CREST center brings together several CUNY partners besides University of Maryland, Baltimore County, University of Puerto Rico, Mayaguez, California State University, LA, and Hampton University and Industrial Partners – Northrop Grumman, Raytheon and ERT.
- NOAA-CREST is primarily partnered with NESDIS since 2001 in research, education and STEM engagement activities and supports NOAA and NESDIS strategic mission. Besides NESDIS, CREST research and education is also aligned with other Line Offices – NWS, OAR, NOS.
- CREST graduates are trained in NOAA Science mission related to Remote Sensing Sciences and Technology yielding a well-trained national STEM talent pool and diverse future workforce for NOAA and other related agencies industries.
- So far, CREST has been able to train and graduate 676 students in NOAA related remote sensing science. More than 40 NOAA scientists are collaborating with CREST researchers in doing NOAA missions sciences.

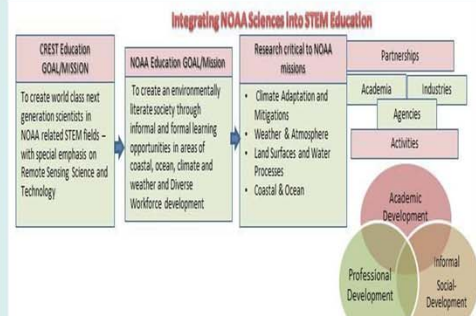
Methods



STEM Learners/Audiences	Acad./Res. Training & Devpt	Professional Training	Social Development
K-12 Community	Summer HS Internships/Weather Camps/After-school mentoring, science enrichment seminars	Summer Symposium presentations/seminars/brown bag sessions	Social/picnic days/cultural / Summer Symp./brown bag sessions
Undergraduates	Research Experience for Undergraduate (REU)	Presentations/paper writing, career/job opportunities seminars	Conf./Symposium presentations/seminars/brown bag sessions
Graduates (Masters/PhD)	Rigorous Research training, research internships at NOAA/NASA/industries etc)	Presentations/paper writing, career/job opportunities seminars	Conf./Symposium presentations/seminars/brown bag sessions
Post doctorates/ Early Career Scientists/Teachers/Professionals	Research projects development, proposal writing, research experience for teachers	Short course training, certification ONLINE courses,	Professional networking, presentations and public engagement

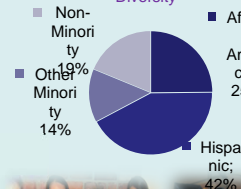


Results



TOTAL ALL CREST STUDENTS	TOTAL #	Female	Male
Pipeline = 262 (HS-42; BS-96; MS-59; PhD - 59)	676	98	164
Graduate = 414 (HS - 104; BS - 168; MS - 99; PhD - 43)	414	179	235
Graduates breakdown			
Total students from underrepresented groups		Female Minority	Male Minority
Pipeline = 184	67	117	
Graduate = 250	414	111	139

CREST Student Population Diversity



Conclusions

- Outreached - > 1000 School (K-12) Students
- Increased NOAA and CREST visibility across NE region among schools and research and educational organizations.
- Improved Students Professional and Career Development and skills
- Recruited, retained, and trained 676 students in last 10 years - 414 graduated of which 75% are Underrepresented Minorities (both CREST funded and its affiliated/leveraged programs) and 262 in pipeline
- Lifelong learners through formal and informal science and educational opportunities
- Environmental and Earth Sciences (Remote Sensing Sciences) literacy
- Increase the sustainability of the program
- Inquiry-based learning
- Develop required career and professional skills for NOAA and other relevant industry and Academia
- Workforce development

Employers that hired CREST Students 2002-12

Federal/State/Local Agencies	Federal Contractors	Industries	Academia/University	Private /Env. Companies
NOAA, NASA, EPA, FEMA, NAVY, FDA DOC/NIST	US Army of Aberdeen Proving Ground Defense Contractors (IIT) Army Research Lab	Raytheon Northrop Grumman IIT, NY ConEd, NY	City University of New York University of Maryland, College Park (CICS) University of Maryland, Baltimore County University of Wisconsin, WI (CIMSS) Penn State University U. Of P. Rico, Aguililla Utah State U, Salt Lake City	Goldman Sachs Other fortune companies Baker International EnTech Engineering, P.C. Arcicabo Lab, PR Battelle Memorial Institute Wakefern SHARP, USA TYCO, Eng Co.
US Army Corps				
DOC/US Patents				
NYDEP, FDNY,				

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