NOAA COOPERATIVE SCIENCE CENTER IN ATMOSPHERIC SCIENCES & METEOROLOGY
EDUCATION RESEARCH IMPACT

NCAS-M Core Competencies, Activities, and Formal Assessments

The following table shows the NCAS-M core competencies, metrics, activities students engage in to achieve the core competencies, and the assessments used to demonstrate mastery.

	NCAS-M Core Competencies	NCAS-M Core Competencies Specific Measurable Metrics	NCAS-M Activities	NCAS-M Assessments
1	**Training in NOAA mission relevant disciplines**	Undergraduate and Graduate students are rigorously trained in NOAA-mission relevant disciplines. Institutional faculty ensure that students are: (a) registered for the most relevant courses in their programs of study, and (b) gaining meaningful experiences with NCAS-M and NOAA communities. **NCAS-M students are trained to:** 1. Describe NOAA's general mission and specifically the NWS mission and strategic plans through the student handbook, focus group discussions, webinars, and professional development training sessions focused on imparting information on NOAA's mission. 2. Relate their individual course of study with NOAA's mission. 3. Apply for scholarships, internships, and employment at NOAA.	1. Orientation meetings – review of NOAA's mission. 2. Participation in NOAA mission-relevant research 3. NOAA Experiential Research and Training Opportunities (NERTO) experiences – interactions with NOAA research and operations personnel 4. Presentation at professional conferences 5. NOAA related field-campaigns. 6. NOAA-mission technical/skill development workshops 7. Center-wide professional development workshops 8. Monthly webinars 9. Student research focus group presentations	• NOAA Experiential Research and Training Opportunities (NERTO) reports and presentations (r*eviewed by NOAA Mentors, NCAS-M Faculty Advisors, Distinguished Scientist (DS), & Education Expert (EE)*) • Oral presentations (*reviewed by NCAS-M faculty advisors*) • Video Abstracts (*reviewed by Communication Specialist & Faculty Advisors*) • Poster presentations (*reviewed by NCAS-M Faculty Advisors*) • Essays (*reviewed by EE*) • Publications (*work in coordination with NCAS-M Faculty Advisors and other co-authors*) • Webinar Pre-/Post-Tests • Webinar Evaluations/Polls • Templates for Focus group presentations (*presentations reviewed by DS*)
2	**Knowledge of the human dimensions associated with environmental, climate, and severe weather issues**	Undergraduate and Graduate Students **c**omplete the NOAA Social Science Basics Training Module (https://training.weather.gov/nwstc/socialscience/presentation_html5.html). **NCAS-M students are equipped to:** 1. Understand the human dimensions associated with environmental, climate, or severe weather issues in NOAA mission research. 2. Distinguish between disciplinary, multidisciplinary, and interdisciplinary approaches to environmental, climate, or severe weather research. 3. Describe the integration of human dimensions in their NOAA-mission research. Or describe the potential human impact of their NOAA-mission research.	1. Social, Behavioral, Economic, and Communications (SBEC) Webinars 2. Center-wide professional development workshops 3. Student research focus group presentations 4. NOAA Social Science Basics Training Module	• Webinar Pre-/Post-Tests • Webinar Evaluations/Polls • NCAS-M Research Focus Group presentations (*presentations reviewed by the DS*) • Course completion confirmation (*collected by EE*)

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3	**Understanding the Observational and Earth System Modeling strategies relevant to NOAA's mission**	1. Identify examples of observational and/or Earth System Modeling (ESM) strategies/techniques relevant to NOAA's mission (see NOAA Observations Systems https://www.weather.gov/about/observation-equipment). 2. Understand and engage in specific observational and/or ESM strategies/techniques related to research in their field of study and explain the connection to NOAA's mission. **Undergraduates and Graduates**: Gain knowledge of these observational and/or ESM strategies and techniques through webinars, coursework, and research.	1. Course work related to observations and data collection 2. Engage in NOAA mission-relevant research for theses/dissertations 3. NERTO experiences – engagement in NOAA research 4. Involvement in NOAA related field-campaigns. 5. NOAA-mission technical/skill development workshops including te chnical skill training at Center-wide professional development workshop	• Successful completion of thesis/dissertation • NERTO reports and presentations (*reviewed by the NOAA Mentors, NCAS-M Faculty Advisors, DS, & EE*) • Technical skills training evaluation with feedback from NOAA mentors • Individual Student Development Plan (ISDP) (*reviewed by EE*) • Satisfactory completion of observation and quantitative data analysis courses
4	**Data analysis and/or modeling relative to discipline**	1. Describe data analysis and/or modeling method(s) used in their research. 2. Successfully complete discipline specific data science courses, assignments, and projects. **Undergraduates:** Understand and apply data analysis and/or modeling techniques to research projects. **Graduates:** Understand and apply data analysis and/or modeling techniques to thesis and dissertation research.	1. Course work related to data analysis and/or modeling 2. Engage in NOAA mission-relevant research for theses/dissertations 3. NERTO experiences – engagement in NOAA research 4. Involvement in NOAA related field-campaigns 5. NOAA-mission technical/skill development workshops 6. Technical skill training at Center-wide professional development workshop	• Successful completion of thesis/dissertation • NERTO reports and presentations (*reviewed by the NOAA Mentors, NCAS-M Faculty Advisors, DS, & EE*) • Technical skills training evaluation with feedback from NOAA mentors • Satisfactory completion of observation and quantitative data analysis and/or modeling courses

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5	**Effective science communication**	1. Demonstrate effective oral and written science communication through NCAS-M activities. 2. Explain the significance of their training and research in support of NOAA's mission. 3. Demonstrate the ability to effectively communicate the relevance of their science/research to non-scientists. **Undergraduates:** Perform oral and written science communication tasks such as poster presentations (e.g., AMS, ETSP Research Colloquium), scientific writing (e.g., essay, academic papers), and engage in scientific discussions/meetings. **Graduates:** Perform oral and written science communications tasks such as oral/poster presentations (e.g., AGU, AMS, NCAS-M Research Focus Groups, NOAA EPP/MSI Biennial Science and Education Forum), scientific writing (e.g., theses, dissertations, publications), and engage in scientific discussions/meetings.	1. Participate in the American Association for the Advancement of Science (AAAS) Communicating Science Workshop 2. Participate in NOAA mission-relevant research 2. NERTO experiences – engagement in NOAA research 3. Presentation at professional conferences 5. NOAA-mission technical/skill development workshops 6. Center-wide professional development workshops 7. Student research focus group presentations 8. Completion of publication manuscripts	• NERTO and other reports and presentations (*reviewed by the NOAA Mentors, NCAS-M Faculty Advisors, DS, & EE*) • Oral presentations (*reviewed by NCAS-M faculty advisors*) • Video Abstracts (*reviewed by Communication Specialist & Faculty Advisors*) • Poster presentations (*reviewed by NCAS-M Faculty Advisors*) • Essays *(reviewed by EE*) • NCAS-M Research Focus Group presentations (*presentations reviewed by NCAS-M Faculty Advisors & DS*) • Publications (*work in coordination with NCAS-M Faculty Advisors & other co-authors*)
6	**Professional development skills related to the NOAA mission workforce**	Undergraduate and Graduate Students gain knowledge and awareness of professional development skills for the NOAA mission enterprise through workshops and webinars. **NCAS-M Students are prepared to:** 1. Demonstrate career development skills gained from professional development workshops and webinars through exposure to networking, career exploration, interviewing, writing resumes, and managing science projects. **2.** Utilize their career development skills to successfully apply for NOAA direct hire and other employment opportunities to enter the NOAA mission workforce.	1. Participate in NCAS-M professional development workshops and webinars (e.g., Professional Development Basics, Effective Communication, Personal Branding, Project Management Essentials) 2. Participate in NOAA professional development webinars (e.g., Finding and Applying for Jobs in the Federal Government: Navigating USA Jobs, Writing your Federal Resume, Interviewing) 3. Participate in NOAA CSC professional development webinars (e.g., NOAA Career Pathways, Applying for NOAA Scholarships)	• Webinar Evaluations/Polls • Documents templates for NERTO (*e.g., cover and acceptance letters*) • Document reviews (*e.g., letters, resumes, emails, essays*) for NERTO and ETSP • NCAS-M resume tips and template • LinkedIn template • NCAS-M professional development resources for students (ncas-m.org) • USAJobs professional development resources for students and alumni (https://www.usajobs.gov/Notification/Events)

Essentially, there are six core competencies with the following flow:

1) Students are well trained in their disciplines and oriented toward NOAA mission fields, in coordination with their faculty advisors and NOAA mentors (relevant emphasis on NWS).
2) They understand and incorporate the human dimensions of NOAA's mission in their learning and practice.
3) They understand NOAA's observational and/or Earth System Modeling (ESM) strategies and participate in measurement, field campaign, and other data collection, analysis, and modeling activities.
4) They are equipped with appropriate NOAA-relevant data analysis techniques and tools/models, and apply them to their projects, theses, and dissertations.
5) They communicate their research proficiently to both professionals and the general public.
6) They are professionally ready and successfully apply to relevant NOAA enterprise employment opportunities and join the NOAA mission workforce.