

EXECUTIVE SUMMARY

RELIABILITY AND VALIDITY (R&V) ASSESSMENT OF THE NATIONAL CFM PROGRAM AND EXAM

In 2008, ASFPM and CBOR voted to have the National CFM® Certification exam and program evaluated for reliability and validity by an independent consulting group. Evaluation criteria for this process were based on a comparison of the existing structure (National CFM® Exam, Program, and Administration) against the National Commission for Certifying Agencies (NCCA) Standards for Accreditation of Certification Programs.

This project actually came about in 2006 for the primary reason that CBOR wanted to know if the CFM exam questions were written correctly and not leading people to choose a specific answer. Also, CBOR wanted to know if the CFM exam was testing on the correct capabilities and competencies of floodplain managers. In order to achieve this goal, a Scope of work was developed using NCCA accreditation standards as a guide. (See Appendix A for R&V Assessment History)

Reliability & Validity Testing

Reliability and Validity testing involves looking at how well the CFM® Program and Exam are constructed to include:

- individual test questions and answer choices are well written based on best testing practices and design
- questions perform both individually and collectively as a well-designed exam
- the exam measures what floodplain managers really need to know and represents current practice in the field
- topics are represented in proportion on the exam comparable to representation in the field
- passing score is properly placed
- exam reflects best available data established following exam construction procedures, exam is legally defensible – properly researched, designed, and documented
- follows an established criteria for best certification practices (NCCA standards)
- proper and consistent procedures are followed for question pool, question design, exam design, scoring, grading, protection of test and results
- proctors are well selected and supervised
- program administration overall is appropriate with policies, procedures, and with adequate autonomy to be consistent with obtaining/qualifying for NCCA accreditation standards

Benefit of Implementing Recommendations (in whole or in part)

- Provides a better certification program that more effectively represents current practice in the field
- Provides a greater defense against liability if sued
- Ensures consistency and transparency in the application of best certification practices & standards
- Establishes a schedule and standard for long term program / exam maintenance and practices to ensure continued best practice
- Provides an unbiased third party (NCCA) review of the CFM® Certification Program and has verified it is valid, reliable, and that it demonstrates key characteristics of competency requirements for floodplain managers
- Accreditation distinguishes the CFM® Certification as coming from a credible certifying agency.

In 2009, CBOR identified a group of Subject Matter Experts (SMEs) from a representative cross section of the floodplain management profession to participate in a Floodplain Management Practice Analysis to

create a comprehensive list of tasks and duties floodplain managers perform. The Subject Matter Experts group was identified consisting of candidates:

- From diverse geographical representation including riverine and coastal areas
- From all levels of government, as well as representatives from private industry and academia
- From a variety of areas of emphasis within the practice of floodplain management
- Committed to continued involvement and support of the National CFM program and exam
- Representation from an accredited state CFM program
- Representation of new FPMs through seasoned FPMs

The ASFPM panel of SMEs convened in July 2009 in Columbus, OH at the OSU Center on Education and Training for Employment (CETE) facility to perform the Floodplain Management Practice Analysis and DACUM process. OSU defines the DACUM (**D**eveloping **A** **C**urricul**U**M) process as a quick, effective, low cost method of analyzing jobs and occupations. (See Appendix A)

These SMEs defined the duties, tasks, general knowledge and skills required for the floodplain management professional and defined the tools, equipment, supplies and materials required for a floodplain manager to perform their duties. The DACUM panel also identified future trends and concerns. This process produced an end product, the “DACUM Chart” which was used by OSU to develop the Verification Survey. (See Appendix B) The survey was distributed to a pool of 6,622 ASFPM members in September 2009 and 2,187 (33%) responses were received. The survey data was summarized by OSU, and became the basis for the R&V Validation process informing the recommended exam blueprint, topic areas, and question writing. (See Appendix C)

The second and third ASFPM panel of SMEs convened in November 2009 and February 2010 in Columbus, OH at the OSU facility to identify and validate exam topic areas, percentages of questions per topic on the exam (exam blue print) and to review / revise exam pool questions, and write new questions using established best practices for question writing.

During the November 2009 and February 2010 meetings, the Subject Matter Experts reviewed the outcomes and results from the DACUM process and Verification Survey. The panelists reviewed the current CFM seven exam categories and recommended new topic percentages for several of the exam categories. OSU held a question writing workshop to train SMEs on proper question construction. All current pool questions were reviewed applying best practices in test question construction.

The third ASFPM panel of SMEs convened in February 2010 in Columbus, OH at the OSU facility to perform the Exam Content Validation process and determine exam passing score.

The February 2010 meeting provided the SNEs time to complete their review of all the questions in the exam pool and to write enough new questions following the question writing guidelines to fulfill the new exam blueprint topic percentages should CBOR choose to adopt the new blueprint. OSU recommended that future CFM Exam and question construction should limit (and over time eliminate) the number of True/False questions to utilize more multiple choice, matching and exercise scenarios that would reduce the probability of an exam taker “guessing” a correct answer (True/False questions have a 50-50% probability of identifying the correct answer). The SMEs established recommendations on exam question structure requirements for question stem and answer choices. The number of answer choices for multiple choice questions should be limited to 4 or 5 total options but whichever number, the number of answer options should be consistent across the entire exam (including “all of the above” or “none of the above”) so as not indicate clues to which option is the answer.

OSU submitted a draft R&V Report in early 2010 which resulted in several exchanges of review and comments from CBOR and the ASFPM Executive Office. The Final R&V report was submitted by OSU prior to the ASFPM Annual Conference in May 2010. CBOR met in March 2010 to discuss the draft report and recommendations. During the meeting, CBOR formed two work groups to review and develop pros and cons for each of the OSU recommendations for:

1. Testing standards
2. Governance of the CFM Program

CBOR met May 8, 2010, during the 2010 ASFPM Annual Conference to review the Final OSU R&V Report and discuss recommendations to improve the National CFM Program and Exam. CBOR formed an R&V Work Group of CBOR members to develop an implementation plan and timeline for implementing OSU recommendations for testing and governance.

CBOR met September 27 to 29, 2010 at the ASFPM Executive Office in Madison, WI. The CBOR R&V Work Group (Diane Calhoun, John Ivey, Rhonda Montgomery, and George Riedel) presented CBOR a plan to phase in the recommendations from the R&V report. CBOR instructed the CFM Exam Review Committee (John Ivey, Diane Calhoun, Mike Parker, Dorothy Martinez, and George Riedel) to complete Phase 1 of R&V including expediting the 2010 CFM Exam Review and coordinating with the ASFPM Executive Office to introduce an updated CFM Exam by January 2011. CBOR then instructed the Exam Review Committee to initiate Phase 2 of R&V as soon as possible in 2011 to update the CFM Exam to comply with the following new exam description and the revised topic percentages (%) recommended by the R&V work group and approved by CBOR.

CBOR met in March 2011 at the ASFPM Executive Office in Madison, Wisconsin. CBOR approved the deletion of True/False questions on the CFM Exam over the next five years. In addition, CBOR approved keeping the same format for the CFM Exam.

The OSU R&V Report and all Appendices are posted on the ASFPM website at www.floods.org.

Overall Recommendation Summary from R&V

A. Governance

- Governance:
 - Grant CBOR autonomy from ASFPM Board in regard to setting policies for the CFM program.
 - Add a public member position to the CBOR.
 - Would need to apply for NCCA Accreditation separately from Accredited States unless the Accredited State Certification programs were absorbed by ASFPM Certification program and were managed by CBOR and administered by ASFPM since accredited states are unlikely to meet the Accreditation criteria (per R&V assessment).
- Policies & Procedures:
 - Revise the current Appeals policy.
 - Create a formal Confidentiality policy.
 - Create a record Retention policy.
 - Create a Security policy.
 - Organize all policies in a formal policy and procedure manual.

- Information for Candidates/Published Information:
 - Update certification statistics at least annually
 - Publish Confidentiality policy
 - Publish ADA Compliance policy
 - Publish exam development information
 - Publish the rationale for the recertification time period.
 - Publish information on how the recertification policy contributes to the professional development of CFMs.
 - Create a comprehensive candidate handbook.

B. Testing

- Exam Development & Maintenance:
 - Develop a protocol for regular exam maintenance and review
 - Develop a schedule for ongoing periodic R&V re-assessments (every 3-5 years)
 - Continue to train, develop, and expand existing group of trained question writers (using best practices provided by OSU during R&V process)
 - Reduce or eliminate True / False questions over time (too easy with 50-50 chance)
 - Reduce percentage of questions which are too hard (<20% getting it right), and those which are too easy (>80% getting it right) review and adjust over time.
 - Increase the exam pool of questions in order to create two forms of the exam where there is a percentage of questions that both forms have, and a percentage of questions unique to either form as defined which are equivalently rated for difficulty and passing score.
 - New question pool, exam blueprint, and cut score deliverables from the R&V process would need to be adopted and implemented as “a whole” for current practice and use to meet NCCA Accreditation standards
 - Must demonstrate that different forms of the exam assess equivalent content. Currently we don’t have two forms of the exam (by psychometric definition of “form” as defined). Plan would need to be in place to create two equivalent forms of the exam and a policy instituted for doing this and ongoing maintenance to qualify for accreditation
 - Develop two separate equivalent CFM Exams
 - Implement new CFM blueprint (% of Questions in Categories)
 - Establish CFM Exam review protocols

Appendix A

2010 Reliability and Validity (R&V) assessment of the National CFM Program and Exam

Annual reviews of the CFM Exam have been conducted by the CFM Exam Work Group, under direction of CBOR and the Profession Development Committee (PDC), since the National CFM Exam was introduced in 1999. At CBOR's request in 2003, the PDC initiated a Reliability and Validity assessment of the CFM Program and the CFM Exam following criteria outlined in *Standards for Educational and Psychological Testing* published by the American Educational Research Association, the American Psychological Association and the National Council of Measurements in Education. The PDC report submitted to CBOR, November 12, 2003, states that the PDC concludes that the ASFPM CFM Program complies with the (Reliability and Validity) standards established by the *Standards for Educational and Psychological Testing*.

During CBOR meetings in 2007 and 2008, plans were initiated to conduct a Reliability and Validity assessment of the entire CFM Program including the CFM Exam. In 2008 ASFPM and CBOR prepared a Request for Proposals (RFP) for a consultant or professional testing firm to perform a Reliability and Validity assessment of the CFM Program. The ASFPM Executive Office responded to questions from various consultants and education experts and received a total of seven (7) proposals from qualified contractors. The contractor selection process was complicated due to several excellent alternated approach proposals received, exceptions requested and technical issues that had to be resolved.

In 2009, ASFPM executed a contract with Ohio State University and initiated the Reliability and Validity (R&V) analysis of the CFM Program and the CFM Exam.

The ASFPM Executive Office provided CFM program background, exam formats and statistics to assist Ohio State with the R&V assessment. There were numerous meetings and correspondence during the R&V start-up period. Ohio State researched the ASFPM National CFM Program and worked closely with CBOR and the ASFPM Executive Office to identify and initiate the initial phases of the R&V assessment.

CBOR's R&V goal was to evaluate how well the CFM exam is constructed to include:

- Individual test questions and answer choices well written on best testing practices and design
- Questions performance both individually and collectively as a well-designed exam
- The exam measures what floodplain managers really need to know (and is current)
- Topics are represented correctly on the exam comparable to representation in the field
- Passing score is properly placed
- Exam is legally defensible – properly researched, designed and documented
- Follows an established criteria for best practices (such as NCCA standards)
- Proper and consistent procedures are followed for question pool maintenance, question design, exam design, scoring, grading, and protection of test results
- Proctors are well selected and supervised
- Program administration overall is appropriate with policies, procedures, and with adequate autonomy to follow and maintain NCAA accreditation standards.

In 2009, CBOR identified a group of Subject Matter Experts (SMEs) from a representative cross section of the floodplain management profession to participate in a Flood Plain Management Practice Analysis

to create a comprehensive list of tasks and duties floodplain managers perform. The Subject Matter Experts (SMEs) group was identified consisting of candidates:

- From diverse geographical representation including riverine and coastal areas
- From all levels of government, as well as representatives from private industry and academia
- From a variety of areas of emphasis within the practice of floodplain management
- Committed to continued involvement and support of the National CFM program and exam
- Representation from CBOR
- Representation from an accredited state CFM program
- Representation from other ASFPM committees

From July 20 to 21, 2009, the ASFPM DACUM Panel of Subject Matter Experts, met with the contractor, Ohio State University Center on Education and Training for Employment in Columbus, Ohio. Ohio State defines DACUM as **Developing A CurriculUM** as a quick, effectively, relatively low cost method of analyzing jobs and occupations that has been used worldwide for more than 40 years. The DACUM Panel of Subject Matter Experts from ASFPM included:

- Jessica Baker, CFM, Program Manager, Halff Associates, Richardson, TX
- Michelle F. Burnett, CFM, Rhode Island State Floodplain Coordinator, Rhode Island Emergency Management Agency, Cranston, RI
- Jerry Hancock, CFM, Stormwater & Floodplain Programs Coordinator, City of Ann Arbor Systems Planning Unit, Ann Arbor, MI
- Laura Hendrix, CFM, Executive Director, Association of Montana Floodplain Managers, Helena, MT
- Christy Miller, CFM, Program Manager, Tetra Tech, Inc. Anchorage, AK
- Stephen Mitchell, CFM, Operations Manager, City of Pascagoula, MS
- Rhonda Montgomery, CFM, Program specialists, FEMA-HQ – Mitigation, Arlington, VA
- Ricardo S. Pineda, CFM, Chief Floodplain Management Branch, State Floodplain Coordinator, Department of Water Resources, Division of Flood Management, Sacramento, CA
- Joe Remondini, CFM, Floodplain Management Services Program Manager, US Army Corps of Engineers, Tulsa, OK
- Robert Rogerson, CFM, Floodplain Manager, Town of Mount Pleasant, Mount Pleasant, SC
- Terri L. Turner, CFM, Assistant Zoning & Development Administration, Augusta-Richmond County Planning Commission, Augusta, GA
- Kait Laufenberg, CFM, Training & Chapter Coordinator, ASFPM, Madison, WI

The ASFPM DACUM Panel defined the duties, tasks, general knowledge and skills required for the floodplain management professions and defined the tools, equipment, supplies and materials required for a floodplain manager to perform his duties. The DACUM panel identified future trends and concerns and designed an ASFPM membership Verification Survey to provide support data to perform the R&V analysis. The survey was distributed to a select pool of 6,622 ASFPM members in September 2009 and 2,187 (33%) responses were received. The survey data was summarized by the contractor, Ohio State University Center on Education and Training for Employment, and became the research basis for the ASFPM R&V analysis.

Attachment 1, DACUM Research Chart for Floodplain Managers, includes:

- Floodplain manager duties and tasks,
- Listing of floodplain manager knowledge and skills
- Floodplain managers tools, equipment, supplies and materials; and
- Future trends and concerns

The DACUM analysis, led by consultants from Ohio State University and representatives from CBOR and the ASFPM Executive Office developed Attachment 2, ASFPM membership Verification Survey.

The ASFPM membership Verification Survey contains extremely valuable information not only for conducting the R&V assessment but also for evaluating the effectiveness of floodplain management programs and identifying training needs. CBOR recognized the value of Attachment 2 and the need to share this information with Federal, state and local partners. Therefore the information included in Attachment 2 has been scrubbed to protect privacy information while leaving raw data for further analysis.

From November 2 to 4, 2009, representatives from the ASFPM R&V Task Force met with the contractor, Ohio State University Center on Education and Training for Employment, in Columbus, Ohio. The R&V Task Force participants included:

- Chad Berginnis, CFM, Senior Specialists, Hazard Mitigation & Floodplain Management, Michael Baker Jr., Inc, Columbus, OH
- Diane Calhoun, CFM, Project Manager, Michael Baker Jr., Inc., Denton, TX
- Warren Campbell, CFM, Hall Professor of Civil Engineering, Western Kentucky University, Bowling Green, KY
- Heidi Carlin, CFM, Floodplain Management Coordinator, Lower Colorado River Authority, Austin, TX
- Cindy Crecelius, CFM, Consultant, CC Consults, Westerville, OH
- John Ivey, CFM, Vice President, Halff Associates, Inc., Fort Worth, TX
- Kait Laufenberg, CFM, Training & Chapter Coordinator, ASFPM, Madison, WI
- Jen Marcy, CFM, Senior Public Information Specialists, PBS&J, Buffalo, NY
- Dorothy Martinez, CFM, Senior Territory Training Manager, H2O Partners, Austin, TX
- Stephen Mitchell, CFM, Operations Manager, City of Pascagoula, MS
- Rhonda Montgomery, CFM, Program specialists, FEMA-HQ – Mitigation, Arlington, VA
- Mike Parker, CFM, Floodplain Coordinator, Santa Barbara County, Santa Barbara, CA
- Joe Remondini, CFM, Floodplain Management Services Program Manager, US Army Corps of Engineers, Tulsa, OK

During the November 2009 work session with Ohio State, the R&V Task Force reviewed the DACUM process and Verification Survey. Ohio State, R&V contractor, presented the results of a review of all CFM Exam questions used since initiation of the CFM Program in 1999. Ohio State presented exam question protocols as a recommended blueprint for future CFM Exams. The Task Force reviewed the current CFM seven (7) exam categories and recommended new % for several of the exam categories. During this work session over 180 actual exam questions were reviewed and revised using the recommended protocol and 17 new exam questions were developed for future exams. The R&V Task Force submitted an R&V Status Report to CBOR with the following recommendations:

1. Instruct the CFM Exam Review Work Group to revise the current exam based on the R&V Task Force recommendations
2. Revise the exam topic categories (%) based on R&V Task Force recommendations
3. Evaluate and incorporate, if appropriate, Ohio State R&V recommendations to finalize R&V

From February 23-24, 2010, an ASFPM Content Validation Workshop was held at Ohio State University Center on Education and Training for Employment in Columbus, Ohio. R&V Task Force participants included:

- Diane Calhoun, CFM, Project Manager, Michael Baker Jr., Inc., Denton, TX
- Heidi Carlin, CFM, Floodplain Management Coordinator, Lower Colorado River Authority, Austin, TX
- Cindy Crecelius, CFM, Consultant, CC Consults, Westerville, OH
- John Ivey, CFM, Vice President, Halff Associates, Inc., Fort Worth, TX
- Kait Laufenberg, CFM, Training & Chapter Coordinator, ASFPM, Madison, WI
- Rhonda Montgomery, CFM, Program specialists, FEMA-HQ – Mitigation, Arlington, VA
- Mike Parker, CFM, Floodplain Coordinator, Santa Barbara County, Santa Barbara, CA

The February 2010 ASFPM Content Validation Workshop resulted in approval of the recommended protocol for CFM Questions. Following recommendations from Ohio State, future CFM Exam should limit the number of T/F questions and utilize more multiple choice, matching and exercise scenarios. The exam question structure requirements were established for question stem and distracter. The number of answer choices for multiple choice questions should be limited to 4 but allow 5 when “all of the above” or “none of the above” is appropriate. The Workshop included a question writing session where new CFM exam questions were developed.

Ohio State submitted a draft R&V Report in early 2010 which resulted in several exchanges of review comments with CBOR, R&V Task Force members, the ASFPM Executive Office and Ohio State. The Final R&V report was submitted by Ohio State prior to the ASFPM Annual Conference in May 2010.

CBOR met May, 8, 2010, during the ASFPM Annual Conference in Oklahoma City to review the Final OHIO State R&V Report and discuss recommendations to improve the CFM Program and National CFM Exam. CBOR formed two work groups to review recommendations for: (1) testing standards and (2) governance of the CFM program.

In September 2010, CBOR authorized the CFM Exam Review Work Group to finalize the annual CFM Exam Review following recommendations of the CBOR R&V Testing Work Group, incorporating exam question revisions, and complying to the newly developed R&V Exam Question protocol.

CBOR met September 27 to 29, 2010 at the ASFPM Executive Offices in Madison, WI. CBOR instructed the CFM Exam Review Work Group to complete Phase 1 of R&V including expediting the 2010 CFM Exam Review and coordinating with the ASFPM Executive Office to introduce an updated CFM Exam by January 2011. CBOR then instructed the Exam Review Committee to initiate Phase 2 of R&V as soon as possible in 2011 to update the CFM Exam to comply with the new exam description and the revised topic/category examples and percentages (%) developed by the R&V Task Force and approved by CBOR.

CBOR met in March 2011 at the ASFPM Executive Offices in Madison, WI to review and approve the 5-year R&V Implementation Plan included as Attachment 3. The ASFPM CFM Exam Review Work Group also met in March 2011 at the ASFPM Executive Offices in Madison, WI, to initiate Phase 2 of the R&V Implementation Plan that includes evaluation of the entire CFM Exam Pool and initiation of the 2011 CFM Exam Review that will produce an updated CFM Exam to be utilized after January 1, 2012.

The Ohio State R&V Report will be posted on the ASFPM webpage, www.floods.org, available for review by ASFPM membership and the floodplain management community. The R&V analysis of the CFM Program has produced extremely valuable information not only for the national CFM Program but also for improvement in all facets of floodplain management. CBOR is evaluating repeating the R&V process every five years.

Draft document developed during the 3/7 to 3/11/2011 CBOR and CFM Exam Review Work Group meetings

Notes by John Ivey

Appendix B

The DACUM Process

DACUM (day-kum)

- an abbreviation for **D**eveloping **A** Curriculum
- an occupational analysis performed by expert workers in the occupation
- an occupational skill profile which can be used for instructional program planning, curriculum development, training materials development, organizational restructuring, employee recruitment, training needs assessment, meeting ISO 9000 standards, career counseling, job descriptions, test development, and other purposes.

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The DACUM philosophy states that:

- Expert workers can describe and define their jobs more accurately than anyone else
- An effective way to define a job is to precisely describe the tasks that expert workers perform
- All tasks, in order to be performed correctly, require certain knowledge, skills, tools, and worker behaviors.

The DACUM process for occupational analysis involves local men and women with reputations for being the “top performers” at their jobs, working on a short-term panel assignment with a qualified DACUM facilitator. Workers are recruited directly from business and industry. These workers become the Panel of Experts who collectively and cooperatively describe the occupation in the language of the occupation.

The Panel works under the guidance of a trained facilitator for two days to develop the DACUM Research Chart. The chart contains a list of general areas of competence called *DUTIES* and several *TASKS* for each duty. Brainstorming techniques are used to obtain the collective expertise and consensus of the committee. As the Panel determines each task, it is written on a card. The cards are attached to the wall in front of the Panel. The completed chart is a graphic profile of the duties and tasks performed by successful workers in the occupation.

The Panel also identifies the general knowledge and skills required of successful workers, the tools, equipment, supplies, and materials used the important worker behaviors essential for success, and the future trends and concerns likely to cause job changes. The process produces superior results for all occupational levels.

DACUM Research Chart

Duties	Tasks										

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DACUM INFORMATION SHEET

What is DACUM (Developing A Curriculum)?

DACUM is an innovative and proved effective approach to job/occupational analysis. It has proven to be a very effective method for colleges, companies, and others to quickly determine, at relatively low cost, the tasks or competencies that must be performed by persons employed in a given job or occupational area.

The profile chart that results from the DACUM analysis is a detailed and graphic portrayal of the skills or competencies involved in the occupation being studied. The DACUM analysis can be used as a basis for (1) curriculum development, (2) student learning, (3) training needs assessments, (4) worker performance evaluations, (5) test development, (6) meeting ADA requirements, (7) meeting ISO 9000 requirements, (8) management decision-making, (9) worker certification, etc.

DACUM has been successfully used both domestically and internationally to analyze occupations at the professional, technical, skilled, and semiskilled levels. DACUM operates on the following three premises: (1) expert workers are better able to describe/define their job than anyone else, (2) any job can be effectively and sufficiently described in terms of the **tasks** that **successful** workers in that occupation perform, and (3) all tasks require certain **knowledge and skills, tools and equipment, and worker behaviors** in order for workers to perform the tasks correctly.

A carefully chosen group of about 5-12 experts from the occupational area form the DACUM panel. Panel members are recruited directly from business, industry, or the professions. The panel works under the guidance of a facilitator for two days to develop the DACUM chart. Modified small-group brainstorming techniques are used to obtain the collective expertise and consensus of the panel.

The DACUM panel is carefully guided through each of the following steps by the facilitator:

1. Orientation to the DACUM process
2. Job or occupational area and development of organizational chart
3. Identification of the duties (general areas of job responsibility)
4. Identification of specific tasks performed for each duty (brainstorming)
5. Identification of general knowledge and skills, tools, equipment, supplies, and materials, worker behaviors needed, and future trends/concerns of the occupation
6. Reviewing and refining the duty and task statements
7. Sequencing the duty and task statements
8. Other options, as desired

Because of their current occupational expertise, panel members do not need to make any advance preparation. Participants on past DACUM panels have, without exception, found the activity to be a professionally stimulating and rewarding experience.

For more information about DACUM training, contact Bob Norton at the Center on Education and Training for Employment, The Ohio State University, 1900 Kenny Road, Columbus, OH 43210-1016; 614-292-8481 or norton.1@osu.edu or website at www.dacumohiostate.com

Appendix C

2

DACUM Research Chart for Floodplain Managers

DACUM Panel

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Sponsored by



Association of State Floodplain Managers
Madison, WI

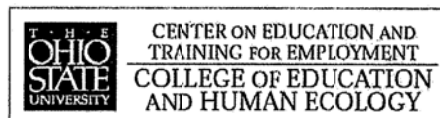
Observer

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Facilitator

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July 20-21, 2009

DACUM Research Chart for Floodplain Managers

Duties		Tasks			
A	Administer Floodplain Management Programs	A-1 Review local, state, & federal development regulations	A-2 Conduct pre-development meetings (e.g. developers, design professionals, stakeholders)	A-3 Process floodplain development permits	A-4 Review Elevation Certificates (ECs)
		A-11 Maintain floodplain ordinances (e.g., model, local, state)	A-12 Interpret floodplain ordinances	A-13 Implement higher regulatory standards (e.g., NAI, CRS, LID)	A-14 Develop policy/position papers, business plans (e.g., 5-year, short & long term)
		A-20 Update floodplain management executive orders	A-21 Reconcile conflicting guidance	A-22 Advocate for floodplain-related legislation	A-23 Develop funding mechanisms (e.g., storm water utilities, grants, special funding)
B	Perform Hazard Identification & Risk Assessment	B-1 Document flood events	B-2 Collect localized data (e.g., rainfall, streamgage data, historical flooding info.)	B-3 Evaluate levee certifications	B-4 Identify at-risk properties behind levees
		B-12 Communicate loss estimation models to decision makers	B-13 Assist with implementing hazard mitigation plans	B-14 Coordinate watershed development across jurisdictional lines	B-15 Identify RL & SRL areas
C	Perform Outreach Activities	C-1 Promote higher development standards (e.g., NAI, freeboard, CRS)	C-2 Participate in community events (e.g., Earth Day, Rotary, open house)	C-3 Promote flood awareness week/month	C-4 Prepare media press releases
		C-11 Organize state & regional conferences	C-12 Conduct training workshops	C-13 Publish floodplain management newsletters	C-14 Provide education & training to local policy makers
D	Perform Customer Service Activities	D-1 Provide flood map information (e.g., BFE, flood zone, map index)	D-2 Provide general technical assistance to customers (e.g., construction techniques, site-specific risk assessments, insurance information)	D-3 Assist in resolution of flood insurance problems	
		E-1 Review LOMCs & newly generated BFE data	E-2 Maintain maps, FISs & other supporting data	E-3 Support H&H for riverine, coastal, & other areas	E-4 Develop future conditions floodplain maps
F	Perform Mitigation & Preparedness Activities	F-1 Implement Community Rating System (CRS) programs	F-2 Develop flood warning systems	F-3 Develop BMPs for LID & green infrastructure	F-4 Pursue mitigation & planning grants/funding
		F-5 Promote No Adverse Impact (NAI)	F-11 Assist with emergency Action, Evacuation, & Response plans		
G	Perform Disaster Response & Recovery Activities	G-1 Implement emergency Action, Evacuation & Response plans	G-2 Coordinate with ICS	G-3 Participate in preliminary damage assessments	G-4 Document extent of flooding & other disasters
				G-5 Identify frequency of flood event	

July 20-21, 2009

A-5 Conduct compliance inspections	A-6 Participate in CAVs & CACs	A-7 Conduct site inspections (e.g., pre/post development, compliance)	A-8 Maintain permit files & documents (e.g., repetitive loss, ECs, LOMC's)	A-9 Review variance requests	A-10 Develop floodplain ordinances
A-15 Address floodplain ordinance violations (e.g., legal actions, stop work orders, 1316)	A-16 Complete FEMA Biennial Reports	A-17 Participate in community meetings	A-18 Coordinate floodplain activities with other agencies (e.g., federal, state, nonprofit)	A-19 Provide technical expertise to policy makers	
A-24 Populate program databases (e.g., CIS, MIP)	A-25 Mentor new floodplain managers				
B-5 Develop levee breach maps	B-6 Develop levee protection zone maps	B-7 Evaluate dam & levee safety	B-8 Develop watershed master plans	B-9 Develop storm water management plans	B-10 Develop master drainage plans
B-11 Conduct risk modeling (e.g., HAZUS, FIA, FDA)	B-16 Identify unique flooding risks (e.g., ice jams, alluvial fans, tsunamis)	B-17 Promote placement & retention of stream & tidal gages	B-18 Identify placement location for warning signs (e.g., evacuation, flood risk)		
C-5 Participate in media interviews	C-6 Publish outreach brochures & handouts	C-7 Distribute outreach brochures & handouts	C-8 Assist with website development	C-9 Develop outreach partnerships with other agencies (e.g., NOAA, utility mailouts, watershed councils)	C-10 Provide training to other professional groups (e.g., engineers, surveyors, realtors)
C-16 Provide outreach to schools (e.g., presentations, poster contests, scholarships)	C-17 Provide public service announcements	C-18 Demonstrate interactive floodplain & watershed models	C-19 Promote placement of historical high water markers	C-20 Develop risk notification tools (e.g., letters, website, maps)	C-21 Promote non-structural floodproofing methods
D-4 Document flooding complaints	D-5 Provide copies of documents (e.g., ECs, forms, certificates)	D-6 Provide substantial damage letters for ICC	D-7 Provide program information (e.g., NFIP, CRS, UHMA)	D-8 Refer customers to other agencies/resources (e.g., websites, contractors, USACE)	D-9 Explain processes to customers (e.g., regulations, LOMCs, permits)
E-5 Determine best available data (e.g., topography, H&H, historical)	E-6 Map repetitive loss areas	E-7 Support flood risk mapping (e.g. MapMod, RiskMap)	E-8 Support community coordination during flood risk mapping process	E-9 Generate flood hazard maps	E-10 Utilize GIS datasets
F-6 Participate in local emergency planning	F-7 Implement hazard mitigation plans	F-8 Participate in development of state & other local communities' multi-hazard mitigation plans	F-9 Coordinate with local emergency responders (e.g., USAR, police/fire, EMA directors)	F-10 Coordinate flood mitigation programs with other agencies	
G-6 Conduct damage assessment surveys	G-7 Assess substantial improvements/damages	G-8 Implement disaster recovery/debris management plans	G-9 Assess rebuilding requirements based on event	G-10 Collect other agencies' damage data	G-11 Communicate damages to decision makers

DACUM Research Chart for Floodplain Managers

Duties		Tasks				
G	Perform Disaster Response & Recovery Activities	G-12 Solicit assistance from others (e.g., EMAC, SMAC, mutual aid)	G-13 Rectify compliance issues	G-14 Prepare mitigation grant & assistance applications (e.g., PA, HMGP, FMA, SRL, & RFC)	G-15 Document Federal and State response recovery grants and loans	
	Perform Administrative Activities	H-1 Manage program budgets	H-2 Develop funding mechanisms (e.g., storm water utilities, grants, special funding)	H-3 Generate quarterly & annual programmatic & fiscal reports	H-4 Author correspondence & reports	
I	Pursue Professional Development	H-12 Develop business plans (e.g., 5-year, short & long term)	H-13 Develop policies, procedures, & guidelines	H-14 Populate program databases (e.g., CIS, MIP)	H-15 Prepare RFPs & bid documents	H-16 Develop professional service contracts
		I-1 Maintain professional certifications (e.g., CFM, NIMS, P.E.)		I-2 Participate in conferences, training & workshops	I-3 Review professional publications	I-4 Participate in task forces, committees, & special projects
		I-11 Author white/position papers	I-12 Present at conferences			

Acronyms

1316	Section 1316 Declaration	H&H	Hydrologic and Hydraulic
BCA	Benefit Cost Analysis	HAZUS	HAZards United States
BFE	Base Flood Elevation	HECHMS	Hydrologic Engineering Center
BMP	Best Management Practices		Hydrologic Modelling System
CAC	Community Assistance Contact/	HECRAS	Hydrologic Engineering Center River
CAV	Community Assistance Visit		Analysis System
CFM	Certified Floodplain Manager	ICC	Increased Cost of Compliance
CFR	Code of Federal Regulations	ICS	Incident Command System
CIS	Community Information System	ID	Identification
COBRA or CBRA	Coastal Barrier Resource Area	LID	Low Impact Development
COE	Corps. of Engineers	LOMC	Letter of Map Change
CRS	Community Rating System	MIP	Mapping Information Platform
DACUM	Developing A Curriculum	NAI	No Adverse Impact
EC	Elevation Certificate	NFIP	National Flood Insurance Program
EMA	Emergency Management Agency	NIMS	National Incident Management System
EMAC	Emergency Management Assistance Compact	NOAA	National Oceanic and Atmospheric Administration
FDA	Flood Damage Assessment	PE	Professional Engineer
FEMA	Federal Emergency Management Agency	RFP	Request for Proposal
FIA	Flood Impact Assessment	RL	Repetitive Loss
FIS	Flood Insurance Study	SDE	Substantial Damage Estimator
FP	Floodplain	SMAC	State Mutual Aid Compact
FPM	Floodplain Management/Manager	SRL	Severe Repetitive Loss
GIS	Geographic Information System	TAO	Tax Assessor's Office
GPS	Global Positioning System	UHMA	Unified Hazard Mitigation Assistance
		USAR	Urban Search and Rescue

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H-5 Participate in agency & interagency meetings	H-6 Serve on committees	H-7 Manage staff	H-8 Provide employee training	H-9 Process messages (e.g., phone, email, mail)	H-10 Manage files	H-11 Maintain contact lists
H-17 Maintain office/field equipment	H-18 Develop interagency agreements	H-19 Monitor program performance	H-20 Monitor local current events			
I-5 Pursue higher education/certifications	I-6 Participate in professional organizations	I-7 Network with peers	I-8 Mentor new floodplain managers	I-9 Advocate for floodplain-related legislation	I-10 Investigate emerging technologies & policies	

Worker Behaviors

Knowledgeable
 Ethical
 Responsible
 Detail oriented
 Accurate
 Organized
 Empathetic
 Competent
 Confident
 Compliance oriented
 Team player
 Fair
 Firm

Inquisitive
 Professional
 Honest
 Enthusiastic
 Flexible
 Non-defensive
 Receptive
 Proactive
 Non-judgmental
 Creative
 Educated
 Compassionate
 Balanced

Passionate
 Resilient
 Responsible
 Advocate
 Grounded
 Discerning
 Mentor
 Good public speaker
 Sense of humor
 Timely
 Assertive
 Articulate
 Consistent

General Knowledge and Skills

Conflict resolution	Basic economics	Environmental regulations
Knowledge of NFIP	Basic math/statistics	Geomorphology
Mediation skills	Public speaking skills	GPS
FEMA/State contacts	Writing skills	Mutual aid agreements
44 CFR 60.3	COBRA zones	Map reading
Stress management	GIS concerns	Development standards
Time management skills	Permitting process	Dam break & inundation
Multitasking skills	Building codes	Natural & beneficial functions of floodplain
Interpersonal skills	Problem solving skills	Hydrology/hydraulics concepts
Facilitation skills	Leadership skills	Nonstructural/structural flood-proofing methodologies
Organizational skills	Decision making skills	Communication skills (written, verbal, listening)
Keyboarding skills	Floodplain mapping	Community/state/federal resources
Computer software literacy	Construction techniques	Mental health issues (staff, customers)
Other agency regulations	Customer service	Bi or multi lingual (desirable)
Grant writing opportunities	Cultural knowledge	
Planning/zoning concepts	ICS	

Tools, Equipment, Supplies and Materials

Maps	
Printer/plotter	
Computer	
Internet/Intranet	
Phone	
Fax	
Shredder	
Copier	
General office supplies	
Workspace	
Digital camera	
Calculator	
GPS	
Vehicle/license	
File cabinets	
Scanner	
44 CFR	
Software: GIS, MS Office, HAZUS, HEC-RAS, HEC-HMS, BCA, SDE, H&H software, Permit software, EC software, TAO software	
Building codes	Boots, steel toed
Measuring tapes	Waterproof paper
Engineering scale	Binoculars
Architect scale	Bug spray
First aid kit	Boat
Waders	Radios
Hard hat	Generator
Protective eyewear	Police scanner
Hand sanitizer	Weather alert radio
Personal flotation device	Flashlight
Masks	Business cards
Gloves	Authenticated identification

Future Trends and Concerns

Lack of adequate staffing & funding
Climate change
Inadequate software/hardware
Combined recovery/debris management plan
Levee issues
Rapid growth of coastal areas
Lack of stream, rainfall & tidal gages
FEMA as a stand-alone agency
Inadequately trained staff
Mentoring state/local floodplain managers
Lack of college degrees and curriculum for floodplain management
Capturing BFE data
Communicating actual risk
Lack of authority to resolve flood insurance issues
Legal attacks on floodplain managers
Lack of training required for floodplain managers
Consistent coordination with emergency management
Disconnect between regulatory and insurance sides
Lack of higher standards in local ordinances
Lack of all hazards insurance
Insufficient funding for flood hazard mapping
Challenge of ensuring compliance
Rapid growth in watersheds
Lack of respect for floodplain regulations

Appendix D

R&V CFM® Survey Fall 2009

Survey Recipients	6622 people (Pool)
Survey Respondents	2187 people (33% of Survey Pool)
Survey Completers	1664 people (25% of Survey Pool)

Survey Completers (1664 people)

Non-CFMs	91	(5% of Completers)
CFMs	1573	(95% of Completers)
ASFPM CFMs	1008	(61% of Survey Completers)
TX CFMs	294	(17% of Survey Completers)
NC CFMs	121	(7% of Survey Completers)
IL CFMs	100	(6% of Survey Completers)
NM CFMs	38	(2% of Survey Completers)
AR CFMs	4	(<1% of Survey Completers)
OK CFMs	3	(<1% of Survey Completers)
No State Provided	5	(<1% of Survey Completers)

Percentage of work time in current job spent on FPM activities?

- 48% of respondents spend 30% or less of their work time on FPM activities, 18% of those respondents spent 1-10% of their time on FPM activities.
- 14% of respondents spend 91-100% of their work time on FPM activities.

Highest degree earned?

1%	No Degree	49%	<i>Bachelor's degree</i>
11%	HS Diploma / Equivalent	29%	Master's degree
7%	Associates degree	2%	Doctorate

Years of FPM experience?

5%	<1 Year	15%	11-15 Years
35%	2-5 Years	6%	>26 Years
25%	6-10 Years		

Sector – Current Position

59%	<i>Public Sector</i>
39%	Private Sector

Current Organization's Sector / Level

2%	N/A	9%	Federal
48%	<i>Local (city, county)</i>	27%	Private
8%	State	1%	Academia
5%	Regional or Multi-State		

Location of Work Organization

N/A	<1%	Region V	12%
International	<1%	Region VI	24%
Region I	2%	Region VII	4%
Region II	2%	Region VIII	8%
Region III	8%	Region IX	11%
Region IV	25%	Region X	3%

Rank FPM Duties by Importance

MOST IMPORTANT

↑	1	Administer FPM Programs (38%), Perform Mapping Activities (23%)
	2	Perform Customer Service (27%), Perform Hazard Identification & Risk Assess (21%)
	3	NONE
	4	NONE
	5	Perform Outreach Activities (20%)
	6	Perform Mitigation & Preparedness Activities (29%)
↓	7	Perform Disaster Response & Recovery Activities (38%)

LEAST IMPORTANT

Considering total set of tasks in the survey, how much do you agree they provide an accurate analysis of the FPM occupation?

Strongly Agree	18%	Somewhat Disagree	4%
Agree	48%	Disagree	2%
Somewhat Agree	23%	Strongly Disagree	5%

Rank the following Knowledge Areas & Skills in order of IMPORTANCE as it pertains to your current role in FPM:

EXTREMELY IMPORTANT

62%	Skill in Map Reading
55%	Knowledge of Floodplain Mapping
55%	Skill in Communication (written, verbal, listening)
50%	Knowledge of the National Flood Insurance Program

IMPORTANT

54%	Skill in Organization
53%	Skill in Facilitation
52%	Skill in Computer Software, Skill in Time Management
51%	Knowledge of Community / State / Federal Resources

SOMEWHAT IMPORTANT

45%	Knowledge of Geomorphology
42%	Knowledge of GPS
37%	Knowledge of Grant Opportunities

NOT IMPORTANT AT ALL

41%	Knowledge of Coastal Barrier Resource Area (COBRA) zones
38%	Knowledge of Mutual Aid Agreements



Rank the following Knowledge Areas & Skills in order of your **FAMILIARITY** with it, as it pertains to your current role in FPM:

VERY FAMILIAR

- 55% *Knowledge of Floodplain Mapping*
- 52% *Knowledge of Basic Math/Statistics*
- 48% Skill in Problem Solving
- 40% Knowledge of Hydrology & Hydraulics Concepts
- 37% Knowledge of Permitting Process

FAMILIAR

- 52% *Skill in Time Management*
- 50% Skill in Leadership
- 49% Skill in Organization
- 47% Knowledge of the National Flood Insurance Program

SOMEWHAT FAMILIAR

- 34% Knowledge of other Agency or Dept. Regulations
- 28% Knowledge of Building Codes

MINIMALLY FAMILIAR

NOT FAMILIAR

- 39% Knowledge of Incident Command Structure (ICS)
- 30% Knowledge of Coastal Barrier Resource Area (COBRA) zones
- 28% Knowledge of Grant Opportunities
- 28% Knowledge of Geomorphology



Considering total set of tasks in the survey, how much do you agree they provide an accurate analysis of the FPM occupation?

Strongly Agree	24%	Somewhat Disagree	1%
<i>Agree</i>	<i>56%</i>	Disagree	<1%
Somewhat Agree	15%	Strongly Disagree	4%

NATIONAL SALARY INFO.

Optional- What is your current salary range? (1551 people answered, 636 skipped this question).

Note: this information is not broken out by state, region, or FPM sector.

4%	N/A	17%	\$61,000 - \$70,000 / Year
2%	\$20,000 - \$30,000 / Year	15%	\$71,000 - \$80,000 / Year
7%	\$31,000 - \$40,000 / Year	9%	\$81,000 - \$90,000 / Year
13%	\$41,000 - \$50,000 / Year	7%	\$91,000 - \$100,000 / Year
<i>18%</i>	<i>\$51,000 - \$60,000 / Year</i>	11%	>\$100,000 / Year

