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 (Developing A CurriculUM) 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 ASFPN 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, KT
- 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, Halfff 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 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 Developing 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.

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.

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May 2011
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

DACUM Research Chart for Floodplain Managers

Sponsored by

Association of State Floodplain Managers
Madison, WI

Observer
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Produced by

OHIO STATE UNIVERSITY
CENTER ON EDUCATION AND TRAINING FOR EMPLOYMENT
COLLEGE OF EDUCATION AND HUMAN ECOCLOGY

1900 Kenny Road
Columbus, OH 43210

July 20-21, 2009

May 2011
## DACUM Research Chart for Floodplain Managers

<table>
<thead>
<tr>
<th>Duties</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Administer Floodplain Management Programs</td>
<td><strong>A-1</strong> Review local, state, &amp; federal development regulations</td>
</tr>
<tr>
<td></td>
<td><strong>A-11</strong> Maintain floodplain ordinances (e.g., model, local, state)</td>
</tr>
<tr>
<td></td>
<td><strong>A-20</strong> Update floodplain management executive orders</td>
</tr>
<tr>
<td><strong>B</strong> Perform Hazard Identification &amp; Risk Assessment</td>
<td><strong>B-1</strong> Document flood events</td>
</tr>
<tr>
<td></td>
<td><strong>B-12</strong> Communicate loss estimation models to decision makers</td>
</tr>
<tr>
<td><strong>C</strong> Perform Outreach Activities</td>
<td><strong>C-1</strong> Promote higher development standards (e.g., NAI, freeboard, CRS)</td>
</tr>
<tr>
<td></td>
<td><strong>C-11</strong> Organize state &amp; regional conferences</td>
</tr>
<tr>
<td><strong>D</strong> Perform Customer Service Activities</td>
<td><strong>D-1</strong> Provide flood map information (e.g., BFE, flood zone, map index)</td>
</tr>
<tr>
<td><strong>E</strong> Perform Mapping Activities</td>
<td><strong>E-1</strong> Review IOMCs &amp; newly generated BFE data</td>
</tr>
<tr>
<td><strong>F</strong> Perform Mitigation &amp; Preparedness Activities</td>
<td><strong>F-1</strong> Implement Community Liking System (CRS) programs</td>
</tr>
<tr>
<td></td>
<td><strong>F-11</strong> Assist with emergency action, evacuation, &amp; response plans</td>
</tr>
<tr>
<td><strong>G</strong> Perform Disaster Response &amp; Recovery Activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>A-5</td>
<td>Conduct code compliance inspections</td>
</tr>
<tr>
<td>A-15</td>
<td>Address floodplain ordinance violations (e.g., legal actions, storm work orders, 1316)</td>
</tr>
<tr>
<td>A-24</td>
<td>Populate program databases (e.g., CIS, MIP)</td>
</tr>
<tr>
<td>E-5</td>
<td>Develop levee breach maps</td>
</tr>
<tr>
<td>E-16</td>
<td>Identify unique flooding risks (e.g., ice jams, alluvial fans, tsunami)</td>
</tr>
<tr>
<td>C-5</td>
<td>Participate in media interviews</td>
</tr>
<tr>
<td>C-16</td>
<td>Provide outreach to schools (e.g., presentations, poster contests, scholarships)</td>
</tr>
<tr>
<td>D-4</td>
<td>Document flooding complaints</td>
</tr>
<tr>
<td>E-5</td>
<td>Determine best available data (e.g., topography, H&amp;H, historical)</td>
</tr>
<tr>
<td>F-6</td>
<td>Participate in local emergency planning</td>
</tr>
<tr>
<td>G-6</td>
<td>Conduct damage assessment surveys</td>
</tr>
</tbody>
</table>
**DACUM Research Chart for Floodplain Managers**

<table>
<thead>
<tr>
<th>Duties</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform Disaster Response &amp; Recovery Activities</td>
<td>- 3-12 Solicit assistance from others (e.g., EMAC, SMAC, mutual aid)</td>
</tr>
<tr>
<td>Perform Administrative Activities</td>
<td>- 3-1 Manage program budgets</td>
</tr>
<tr>
<td>Pursue Professional Development</td>
<td>- 3-12 Develop business plans (e.g., 5-year, short &amp; long term)</td>
</tr>
<tr>
<td>- 1 Maintain professional certifications (e.g., CFM, NIMS, P.E.)</td>
<td>- I-12 Participate in conferences, training &amp; workshops</td>
</tr>
<tr>
<td>- 11 Author</td>
<td>- I-12 Present at/white/position conferences</td>
</tr>
</tbody>
</table>

**Acronyms**

- 1316: Section 1316 Declaration
- 3CA: Benefit Cost Analysis
- 3FE: Base Flood Elevation
- 3MP: Best Management Practices
- 3ACU: Developing A Curriculum
- 3AV: Community Assistance Visit
- 3FM: Certified Floodplain Manager
- 3FR: Code of Federal Regulations
- 3IS: Community Information System
- 3OBR: Coastal Barrier Resource Area
- 3OE: Corps. of Engineers
- 3RS: Community Rating System
- 3ACU: Developing A Curriculum
- 3EC: Elevation Certificate
- 3MA: Emergency Management Agency
- 3MAC: Emergency Management Assistance Compact
- 3DA: Flood Damage Assessment
- 3FA: Federal Emergency Management Agency
- 3IS: Flood Impact Assessment
- 3F: Floodplain
- 3FM: Floodplain Management/Manager
- 3GIS: Geographic Information System
- 3APS: Global Positioning System

**Acronyms Meanings**

- H&H: Hydrologic and Hydraulic
- HAZUS: HAZards United States
- HECMS: Hydrologic Engineering Center
- HECRAS: Hydrologic Engineering Center River Analysis System
- ICC: Increased Cost of Compliance
- ICS: Incident Command System
- ID: Identification
- LID: Low Impact Development
- LOMC: Letter of Map Change
- MP: Mapping Information Platform
- NA: No Adverse Impact
- NFM: National Flood Insurance Program
- NIMS: National Incident Management System
- NOAA: National Oceanic and Atmospheric Administration
- PE: Professional Engineer
- RFP: Request for Proposal
- RL: Repetitive Loss
- SD3: Substantial Damage Estimator
- SMAC: State Mutual Aid Compact
- SRL: Severe Repetitive Loss
- TAO: Tax Assessor’s Office
- UHMA: Unified Hazard Mitigation Assistance
- USAR: Urban Search and Rescue

May 2011
<table>
<thead>
<tr>
<th>H-5 Participate in agency &amp; interagency meetings</th>
<th>H-6 Serve on committees</th>
<th>H-7 Manage staff</th>
<th>H-8 Provide employee training</th>
<th>H-9 Process messages (e.g., phone, email, mail)</th>
<th>H-10 Manage files</th>
<th>H-11 Maintain contact lists</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-17 Maintain office/field equipment</td>
<td>H-18 Develop interagency agreements</td>
<td>H-19 Monitor program performance</td>
<td>H-20 Monitor local current events</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 Pursue Higher education/certifications</td>
<td>I-6 Participate in professional organizations</td>
<td>I-7 Network with peers</td>
<td>I-8 Mentor new floodplain managers</td>
<td>I-9 Advocate for floodplain-related legislation</td>
<td>I-10 Investigate emerging technologies &amp; policies</td>
<td></td>
</tr>
</tbody>
</table>

**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
Menor
Good public speaker
Sense of humor
Timely
Assertive
Articulate
Consistent

July 20-21, 2009
### General Knowledge and Skills

<table>
<thead>
<tr>
<th>Conflict resolution</th>
<th>Basic economics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of NFIP</td>
<td>Basic math/statistics</td>
</tr>
<tr>
<td>Mediation skills</td>
<td>Public speaking skills</td>
</tr>
<tr>
<td>FEMA/State contacts</td>
<td>Writing skills</td>
</tr>
<tr>
<td>14 CFR 60.3</td>
<td>COBRA zones</td>
</tr>
<tr>
<td>Stress management</td>
<td>GIS concerns</td>
</tr>
<tr>
<td>Time management skills</td>
<td>Permitting process</td>
</tr>
<tr>
<td>Multitasking skills</td>
<td>Building codes</td>
</tr>
<tr>
<td>Interpersonal skills</td>
<td>Problem solving skills</td>
</tr>
<tr>
<td>Facilitation skills</td>
<td>Leadership skills</td>
</tr>
<tr>
<td>Organizational skills</td>
<td>Decision making skills</td>
</tr>
<tr>
<td>Keyboarding skills</td>
<td>Floodplain mapping</td>
</tr>
<tr>
<td>Computer software literacy</td>
<td>Construction techniques</td>
</tr>
<tr>
<td>Other agency regulations</td>
<td>Customer service</td>
</tr>
<tr>
<td>Grant writing opportunities</td>
<td>Cultural knowledge</td>
</tr>
<tr>
<td>Planning/zoning concepts</td>
<td>ICS</td>
</tr>
</tbody>
</table>

### 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
- Measuring tapes
- Engineering scale
- Architect scale
- First aid kit
- Naders
- Hard hat
- Protective eyewear
- Hand sanitizer
- Personal flotation device
- Masks
- Gloves
- Boots, steel toed
- Waterproof pape
- Binoculars
- Bug spray
- Boat
- Radios
- Generator
- Police scanner
- Weather alert radio
- Flashlight
- Business cards
- Authenticated identification

### Future Trends and Concerns

- Lack of adequate staffing & funding
- Climate change
- Inadequate software/hardware
- Combined recovery/debris management plan 
- Scare 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

May 2011
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% Bachelor’s degree |
| 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% Public Sector
39% Private Sector

Current Organization’s Sector / Level

| 2% N/A | 9% Federal |
| 48% Local (city, county) | 27% Private |
| 8% State | 1% Academia |
| 5% Regional or Multi-State |
Location of Work Organization

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>International</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Region I</td>
<td>2%</td>
</tr>
<tr>
<td>Region II</td>
<td>2%</td>
</tr>
<tr>
<td>Region III</td>
<td>8%</td>
</tr>
<tr>
<td>Region IV</td>
<td>25%</td>
</tr>
<tr>
<td>Region V</td>
<td>12%</td>
</tr>
<tr>
<td>Region VI</td>
<td>24%</td>
</tr>
<tr>
<td>Region VII</td>
<td>4%</td>
</tr>
<tr>
<td>Region VIII</td>
<td>8%</td>
</tr>
<tr>
<td>Region IX</td>
<td>11%</td>
</tr>
<tr>
<td>Region X</td>
<td>3%</td>
</tr>
</tbody>
</table>

**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?

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>18%</td>
</tr>
<tr>
<td>Agree</td>
<td>48%</td>
</tr>
<tr>
<td>Somewhat Agree</td>
<td>23%</td>
</tr>
<tr>
<td>Somewhat Disagree</td>
<td>4%</td>
</tr>
<tr>
<td>Disagree</td>
<td>2%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>5%</td>
</tr>
</tbody>
</table>

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%
Agree 56%
Somewhat Agree 15%
Somewhat Disagree 1%
Disagree <1%
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.

<table>
<thead>
<tr>
<th>Salary Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>4%</td>
</tr>
<tr>
<td>$20,000 - $30,000 / Year</td>
<td>2%</td>
</tr>
<tr>
<td>$31,000 - $40,000 / Year</td>
<td>7%</td>
</tr>
<tr>
<td>$41,000 - $50,000 / Year</td>
<td>13%</td>
</tr>
<tr>
<td>$51,000 - $60,000 / Year</td>
<td>18%</td>
</tr>
<tr>
<td>$61,000 - $70,000 / Year</td>
<td>17%</td>
</tr>
<tr>
<td>$71,000 - $80,000 / Year</td>
<td>15%</td>
</tr>
<tr>
<td>$81,000 - $90,000 / Year</td>
<td>9%</td>
</tr>
<tr>
<td>$91,000 - $100,000 / Year</td>
<td>7%</td>
</tr>
<tr>
<td>&gt;$100,000 / Year</td>
<td>11%</td>
</tr>
</tbody>
</table>