Ethics in Floodplain Management

Texas Floodplain Management Association

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This presentation outlines a number of ethical issues often encountered in floodplain management, H&H, floodplain modeling and mapping.
Agenda

- Discussion of ethics
- Focus on technical decisions regarding floodplain modeling, mapping and administering the communities FPM program
- Ethical decisions resulting from political pressure; project deadlines; supervisor or peer pressures; company, agency or community policy; unclear standards or regulations; and financial impacts
- Examples of actual cases
Exactly What are (is) “Ethics?”

- Rules or standards that guide individuals or organizations to do the moral or right thing.
  (Adapted from Center for Army Leadership)

- Moral – making right decisions by distinguishing between right or wrong in accordance with the principles of right or wrong.
  (Webster’s Dictionary)
Adequate Standards of Ethics

- Ethical standards also include those that enjoin virtues of:
  - Honesty
  - Compassion
  - Loyalty
  - Rights
    - The right to life
    - The right to freedom from injury
    - The right to privacy
Development of Ethical Standards

- Ethics requires a **continuous effort of studying** our own moral beliefs and our moral conduct, and striving to ensure that we, and the institutions and professions we help to shape, **live up to standards** that are reasonable and solidly based.
Some Fundamentals of Ethics

ASFPM Website
www.floods.org

ASCE Website
https://www.asce.org/inside/codeofethics/

AICP Website
http://www.planning.org/ethics/ethicscode.htm
Learn From Others

- The GIS Certification Institute points out that “GIS professionals commit themselves to ethical behavior rather than merely seeking to avoid specific acts.”
- There may be reasonable exceptions to any avoidance rule and there is implicit approval of any act not on the avoidance list.
FBI Core Values

- Rigorous obedience to the United States Constitution;
- Respect for the dignity of all those we protect;
- Compassion;
- Fairness;
- Uncompromising personal and institutional integrity;
- Accountability by accepting responsibility for our actions and decisions and their consequences; and
- Leadership, by example, both personal and professional.

[These are also great floodplain manager values!]
AICP Code of Ethics and Professional Conduct

1. Aspiration principles that constitutes the ideals to which planners are committed
2. Rules of Conduct to which planners are held accountable
3. Procedural provisions of the AICP Code
4. Procedural provisions that govern situations in which a planner is convicted of a serious crime
Certifications with Ethics Standards

- American Society of Landscape Architects – ASLA
- American Society of Civil Engineers – PE
- American Planning Association – AICP
- American Institute of Architects – AIA
- American Academy of Water Resources Engineers – DWRE
- American Society of Photogrammetry and Remote Sensing – GIS-LS
- Association of State Floodplain Managers – CFM
- International Erosion Control Association – CPESC; CPSWQ
- International Association of Emergency Managers – CEM
- GIS Certification Institute – GISP
- National Council of Examiners for Engineering and Surveying – RPLS
CFM’s Code of Ethics
CFM’s Code of Ethics

- Practice **honesty and integrity** in all of my professional relationships with the public, peers and employer.
- Be **truthful and accurate** in my professional communications.
- Be **fair and considerate** of all persons.
CFM’s Code of Ethics

- Foster **excellence** in floodplain management by staying abreast of pertinent issues.
- Enhance individual performance by attention to **continuing education** and technology.
CFM’s Code of Ethics

- Avoid **conflicts of interest** resulting in personal gain or advantage.
- Be economical in the utilization of the nation’s resources through the effective use of funds, **accurate assessment** of flood-related hazards and **timely decision-making**.
CFM’s Code of Ethics

- Maintain the confidentiality of privileged information.
- Promote public awareness and understanding of flood-related hazards, response to flood disasters, floodplain resources and flood hazard response.
- Be dedicated in serving the profession of floodplain management and to improving the quality of life.
CFM Ethics Quick Test

- Is the action legal?
- Does it comply with FPM values and ethics?
- If you do it, will you feel bad?
- How would it look in the newspaper?
Fundamental Principles & Canons of Engineering Ethics
State of Texas

TEXAS ENGINEERING PRACTICE ACT AND RULES CONCERNING THE PRACTICE OF ENGINEERING AND PROFESSIONAL ENGINEERING LICENSURE

Chapter 137: Compliance and Professionalism

Subchapter A: Individual and Engineer Compliance

137.17 Continuing Education Program

d) A minimum of 1 PDH per renewal period must be in the area of professional ethics, roles and responsibilities of professional engineering, or review of the Texas Engineering Practice Act and Board Rules.
Fundamental Principles

Engineers uphold and advance the *integrity, honor and dignity* of the engineering profession by:

- . . .knowledge and skill for the *enhancement of human welfare*. . .
- being *honest and impartial* and serving with *fidelity the public*, their employers and clients;
Canon 1

Engineers shall hold paramount the safety, health and welfare of the public. . .

- . . .shall recognize that the lives, safety, health and welfare of the general public are dependent upon engineering judgments, decisions and practices . . .

- . . .shall approve or seal only those design documents, reviewed or prepared by them, which are determined to be safe for public health and welfare. . .

- Engineers whose professional judgment is overruled under circumstances where the safety, health and welfare of the public are endangered, or the principles of sustainable development ignored, shall inform their clients or employers of the possible consequences.
Canon 2

Engineers shall perform services *only in areas of their competence*.

- . . .shall undertake to perform engineering assignments *only when qualified by education or experience in the technical field of engineering involved*.

- Note: ASFPM is currently evaluating specialized certification classifications for CFM’s. CFM will be the primary certification but, in the future, individuals may also have a specialized certification classification such as “coastal”, “mitigation”, “floodplain surveying”, or similar classification.
So, What Are the Consequences of Unethical Decisions?
Consequences of Unethical Decisions

- Impacts public safety
- Poor or faulty engineering/actions
- Erroneous floodplain maps
- Structures exposed to flood risk
- Unfair to public
- Inequities in projects
- Lawsuits/liability
Consequences of Unethical Decisions
Consequences of Unethical Decisions
Potential Ethical Issues…

Relating to Technical Decisions
Potential Ethical Issues. . .

How do we manipulate hydrologic and hydraulic parameters?
Potential Ethical Issues

- Hydrologic and hydraulic computer models used by inexperienced engineers and technicians is like a surgeon’s scalpel in the hands of a medical student!
- The results are about the same.
Successfully calibrating a hydrologic model to the “perfect storm” utilizing “reasonable” estimates of hydrologic parameters is where art and science merge (and ethical decisions are often made).
Hydrology

Technical decisions on the hydrologic methods used, the parameters chosen, the objectives/uses of the study or design, can often become ethical decisions.

Q = CiA?
HEC-HMS?
TR-20?
TR-55?
HEC-1?
Regression Equation?
Hydraulics

Technical decisions on the hydraulic modeling used, the parameters chosen, the objectives/uses of the study or design, can often become ethical decisions.
Hydraulic Parameters
Subject to Ethical Decisions

Let’s vote on how many cross-sections to use: one every 5 miles or one every 10 miles!
Floodplain Impacts by Ethical Decisions

- Floodplain and floodway delineations and modifications (map revisions)
- Loss of “valley storage”
- Allowing development that exceeds capability of flood control facilities (levees, channels, diversions, dams)
Floodplain Impacts by Ethical Decisions

- Corps of Engineers’ Section 404 permits
- Floodplain land reclamation potential (before and after project conditions)
- Alteration of the watershed drainage area and/or natural flow patterns (diversion issue)
- Justification of floodway development (no rise)
- Negative impacts to endangered species and wildlife habitat
Ethical Issues in Floodplain Studies and Floodplain Management

EXAMPLES
Example 1

- Hurricane Ike (2008) = deep flooding and damages
- Residence declared “substantially damaged”
- Mayor, also a realtor, buys the single family home
- Mayor applies for building permit to floodproof and convert the home into a business
- Mayor submits an Elevation Certificate (EC) showing lowest floor is 2” above the BFE (floodproofing NR)
- Channel 13 questions the validity of the EC
- New EC shows lowest floor to be 4’ below BFE
- Channel 13 – “Did the mayor’s duty to help hurricane victims take a back seat to his own pocket?”
- Ethics???????????????????
Related Quotes

- Mayor – “Every one-story house in this town that got flooded with more than two feet of water should have been torn down”
- Homeowner - “He wasn’t straight with us. He played us crooked”
- Building Official – “I couldn’t challenge the professionally sealed survey or the professional estimates of damages”
Example 2

- Five property owners, in an exclusive waterfront subdivision, were damaged by Hurricane Ike
- FEMA damage inspectors determined structures were not substantially damaged
- Property owners submitted contractor estimates showing repairs exceed 50% of market value
- Community then declared structures as substantial damaged
- Property owners accept HMGP buyout offer
- Ethics? – Were contractor estimates legitimate?
Substantial Damage Determination

- Market value for one beachfront home, based on 2008 Appraisal District data, was $1M
- Property was determined to be substantially damaged following Hurricane Ike
- Owner agreed to HMGP funded buyout and calculated purchase price was $812,000
- The substantially damaged property is currently renting for $5,428/week (peak season rate)
- DEM is investigating because SD determination was based on a market value of $366,000
- Ethics????????
Example 3
Engineer develops a very complex hydraulic model with divided flow, overflow routes and numerous assumptions regarding effective flow, floodplain and floodway locations.
Example 3
Engineer develops a very complex hydraulic model with divided flow, overflow routes, and numerous assumptions regarding effective flow, floodplain and floodway locations. Engineer seeks and receives a LOMR from FEMA.

RESULTS . . .
- Although technically feasible, the limits of reasonable assumptions were stretched.
- Allowed desired industrial development and economic benefit to city!
Example 4

Engineer prepared a Conditional Letter of Map Revision to document a proposed project which would include computing an effective floodway limit.
Example 4
Engineer prepared a Conditional Letter of Map Revision to document a proposed project which would include computing an effective floodway limit.

RESULTS . . .
- The engineer selected encroachment stations that favored his client, to the detriment of the property owners on the opposite side of the stream.
Examples 5 - 7
Compliance and Ethical Issues in Coastal Zone V (Coastal High Hazard Areas)
Examples 5 - 7

Zone V Requirements

- Bottom of lowest horizontal structure member must be elevated above BFE
- Area below BFE = parking & storage only
- Break away walls required below BFE
- No fill can be used for structural support
- Enclosure below BFE less than 300 sf
Example 5
Compliant Structure in Zone V

Parking/storage & Open Space
Example 6

V Zone Compliant

Parking/storage & Open Space
Example 7

V Zone Violation

Living area below BFE & Non-Breakaway Walls
Hurricane Ike Compliant Structure
Examples 5 - 7

V Zone Typical Ethics Issues

- Failure to enforce the FPM ordinance:
- Illegal enclosures below BFE
- Non-break away construction below BFE
- Failure to enforce substantial damage rule
- Failure to red tag unpermitted construction
- Failure to initiate “Section 1316”
Example 8

*Use of Correct Bench Mark*

- Problem: Utilization of a BM that has been “disturbed” or inaccurate can result in new construction below BFE.
- Use of an incorrect elevation for a BM in Jefferson County, Texas resulted in homes being constructed - 3’ below BFE and resulted in flooding by Ike.
- Ethics issue: Knowingly referencing incorrect BM
Incorrect land surveys that have prevented dozens of hurricane-damaged homes from being rebuilt could have been avoided if surveyors had followed proper practices, according to a report by the state surveying agency.

Two Southeast Texas surveyors have been reprimanded and assessed a $6,000 fine for filing incorrect elevation figures for two LaBelle-area homes, which flooded in Hurricane Ike's storm surge.

Surveyors broke four of the licensing agency rules when they used old data from previously files documents instead of checking the current FIRM.

Five lawsuits have been filed against one surveyor, charging that the company used deceptive trade practices and fraudulently filed elevation certificates.
La Belle Surveys

- The initial survey began at a NGS benchmark placed in 1954 in a culvert at the intersection of FM 365 and the Southern Pacific railroad. The BM was likely destroyed in the late 1990s during construction on West Port Arthur Road.
- The monument, a brass disk, was officially listed at 6.32 feet and checked again five years later (1959).
- In 1983, FEMA surveyed the area again for its 1984 flood map, and, using the benchmark as a reference point, recorded its elevation as 3.1 feet lower. Three other benchmarks within two miles also sank, according to an NGS investigation spurred by a Beaumont Enterprise information request. FEMA blamed the shift on subsidence, but local officials say it could be caused by surveyor error.
Example 9

Use of Correct Flooding Source

- In coastal areas the 1% flood (BFE) can be from coastal surge, riverene, or combined probability (i.e., coastal surge and riverene). The difference can be significant.
- Ethics: Use the correct BFE.
Tidal

Combined (Tidal + Riverine)
### Ethics & Floodplain Management

#### Floodway Data

<table>
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<th>Flooding Source</th>
<th>Floodway</th>
<th>Base Flood Water Surface Elevation</th>
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<td>Width (Feet)</td>
<td>Section Area (Square Feet)</td>
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<td>-----------------</td>
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<td>Armand Bayou</td>
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<td>D</td>
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<tr>
<td>Z</td>
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1. Feet above confluence with Clear Creek (Clear Lake)
2. Elevation computed using combined probability analysis
3. Elevation computed without consideration of backwater effects from Clear Creek (Clear Lake)
Example 10
Floodway Violations

- Manufactured home placed in floodway without a permit
- Ethics issues:
  - Grant a variance? (yes or no)
- What should the LFA Actions be:
  - Require owner to relocate out of floodway, or
  - Require owner to elevate above BFE (Zone A/AE)
  - Violation, fine, legal action, Section 1316?
Manufactured Home in Floodway
Manufactured Homes in Floodway?
Example 11

Correct Use of “No Rise”

- 44 CFR 60.3.d (3)
- “Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels during occurrence of the base flood discharge.”
No Rise – 44 CFR

- Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the regulatory floodway:

- Requirement applies to all construction.
No Rise – 44 CFR

- ……unless it has been demonstrated through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that the proposed encroachment would not result in any increase in flood levels during occurrence of the base flood discharge.

- In other words – run the FEMA Model with the proposed encroachment.

- +0.01’ is a rise so don’t issue the permit.
Ethical Issues in the Floodway

- Proof of “no rise” is a requirement of the developer **not** the local FPA
- Local FPA must have technical data on file to support all “no rise” determinations.
- The Floodway Boundaries are determined by H&H Model and not by NG elevation.
- Community must enforce substantial improvement rule in FP and FW.
- **When in doubt require a CLOMR!**
Example 12

**Developer improperly moved channel and floodway onto adjacent property**

- Developer engaged an engineer to design channel improvements on property not owned by the developer.
- The engineer designed a channel relocation project to move the floodway (unknowingly onto the adjacent property not owned by developer)
- The engineer then compounded the problem by obtaining a LOMR thinking the developer owned the entire site
- Adjacent property owner has filed a suit and the case is currently in court
Do you have Ethics examples?

- Engineering?
- Surveying?
- H&H?
- Mapping?
- Community enforcement or lack of?
- Others?
Ethical Issues in Floodplain Management

EXAMPLES
1. Repetitive Loss Structure #1

- House located in the floodway
- 7 Paid “major” insurance claims
- Never “red tagged”
- Lack of enforcement by the community
2. Repetitive Loss Structure #2 - Zone A

- Repetitive Loss Structure in Zone AE (slab on grade)
- 3 year old home flooded 3 times (substantial damage?)
- Question: Was the home properly permitted/elevated?
- Solution – Red tag after next flood and buyout or elevate
“Reasonably Safe From Flooding”

- 44 CFR 60.3.a.3 and 4 state that the community shall review permit applications to determine whether proposed building sites will be reasonably safe from flooding.
- What about the next 2 examples?
3. Zone AE – Riverside of Levee

- Zone AE – MH’s on riverside of a levee
- Flood Depth approximately 20 feet above grade
- 73 Elevated Homes in this area
- 299 Insurance Claims Paid
- LFA Action - No new mobile homes allowed
- All damaged homes must be removed
4. Zone A - Riverside of Levee

- Zone A – without floodway (NFIP loophole)
- Levee protects to the 500-year flood
- However new home is on riverside of levee
- Water’s edge 50 feet behind home and eroding
- Levee Toe – 200 feet in front of home
- Solution - prohibit development riverside of levee
- PM 52 may help resolve this problem
5. Ethical Issues in Coastal V Zones

- We need to look beyond minimum NFIP
- How to regulate coastal areas with aggressive erosion rates?
- How to address areas subject to Sea Level Rise?
- How to use 30-year-old “out-of-date” FIRMs, and BFEs?
- How to require Zone VE requirements in areas incorrectly mapped as Zone AE?
Texas Shoreline Erosion

Figure 3. Rate of Gulf of Mexico shoreline change from the Brazos River to Sabine Pass
Shoreline Erosion vs. NFIP

Based on The Heinz Institute research, erosion can increase the risk of damage. Two identical homes are located in Zone VE where the shore is eroding at a rate of 5-ft per year. The house on the right is located 10 feet from the shoreline where the house on the left is 200 feet from the shoreline. Both houses are elevated above the BFE. The houses have identical insurance policies and premiums even though the house closer to the shore has a much greater risk of being damaged as a result of erosion or erosion-related flooding that the other house located further back.
NFIP Does Not Address Sea Level Rise

Figure 2. Monthly average sea level since 1909 as measured by the Pier 21 tide gauge in Galveston Bay. Straight line is a linear regression through all the data points.
6. Ethics in CBRA, OPA and Zone V

- Following Hurricane Ike it was discovered newly constructed structures located in CBRA areas had been incorrectly issued NFIP policies.
- One structure covered by a NFIP policy was constructed over water (not eligible for NFIP coverage) and the insurance agent’s office address was listed on the policy as the property address.
7. Wetlands and Habitat Areas

- 44CFR60.3.a.2 – “Review proposed development to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law”…

- Wetlands (Section 404 permits)
- ESA (Section 9 and 10 permits)
- Others permits and approvals?
Texas Endangered Species List

- 108 Species in Texas
  - Amphibians – 7
  - Clams -1
  - Flowering Plants – 34
  - Reptiles – 9
  - Arachnids -11
  - Crustaceans – 2
  - Insects – 9
  - Snails -5
  - Birds – 15
  - Fishes -11
  - Mammals-4

Source: http://www.fws.gov/ifw2es/endangeredspecies/lists/ListSpecies.cfm
ESA & 404 Requirements


- For LOMR-F submittals, FEMA now requires that the community floodplain administrator certify that a proposed project complies with ESA Sections 7, 9 & 10.
Certification Requirements
FEMA MT-1 Form 3, Community Acknowledgement Form

- The project or proposed project (has or does not have) the potential to impact an endangered species therefore documentation is attached to this certification document showing compliance with Sections 9 and 10 of the Endangered Species Act (ESA). Section 9 of the ESA prohibits anyone from “taking” or harming an endangered species.
- The project or proposed project (includes or does not include) an action that might harm an endangered species, therefore required permits have been obtained from the US Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA.
- The project or proposed project (includes or does not include) actions that have been authorized, funded, or being carried out by Federal or State agencies, and documentation from the appropriate agencies showing its compliance with Section 7(a)(2) of the ESA are attached to this certification.
8. Ethics Issues in Wetlands

- Issuing earthwork (grading) permits prior to wetland determination/permit and ESA determinations violates 44CFR60.3.a.2
- While beavers are not required to obtain permits, removal of beaver dams requires a development permit + Wetland (404) permit + proof of ESA compliance
9. Forest Grove Subdivision

- Plans have just been approved and permits issued for Forest Grove, a 200 lot planned development on Larson Creek in Zone AE.
- The 500 acre watershed on Larson Creek above Forest Grove is a heavy timber area mapped as Zone A.
- Recent action - the entire 500 acre timber area has been “clear cut” leaving bare earth.
- What should the LFA do?
- What should the developer’s engineer do?
Larson Creek Forest #7 Zone A
Forest Grove Subdivision
Zone AE
Floodway

Ethics & Floodplain Management
## Roughness Coefficient

<table>
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<tr>
<th>Floodplains</th>
<th>Manning's n</th>
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<tbody>
<tr>
<td>Pasture, Farmland</td>
<td>0.035</td>
</tr>
<tr>
<td>- Light Brush</td>
<td>0.050</td>
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<tr>
<td>- Heavy Brush</td>
<td>0.075</td>
</tr>
<tr>
<td>- Trees</td>
<td>0.15</td>
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<tr>
<td>- Clean Earthen Channel</td>
<td>0.022</td>
</tr>
<tr>
<td>- Smooth Concrete Channel</td>
<td>0.012</td>
</tr>
</tbody>
</table>
Manning’s Formula

- \( Q = A \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2} \)
- \( Q \) = Discharge (cu. ft./sec.)
- \( A \) = Cross-sectional Area of Flow (sq. ft.)
- \( n \) = Coefficient of Roughness
- \( R \) = Hydraulic Radius (ft.)
- \( S \) = Slope (ft./ft.)
## Effects of Clear Cut

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<thead>
<tr>
<th>Trees (Forest)</th>
<th>Heavy Brush</th>
<th>Light Brush</th>
</tr>
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<tbody>
<tr>
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<td>0.075</td>
<td>0.050</td>
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<tr>
<td>n 0.15</td>
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<td></td>
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<tr>
<td>P 1000ft</td>
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<td></td>
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<tr>
<td>S 0.02’’</td>
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</tr>
<tr>
<td>R 1.00ft</td>
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<tr>
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</tr>
<tr>
<td>V 1.4fps</td>
<td>2.8fps</td>
<td>4.2fps</td>
</tr>
</tbody>
</table>
10. Unethical Use of LOMC

A developer proposes to construct a 200 acre development:

- A major portion of the 200+ acre tract is in the SFHA and a portion in the floodway.
- Developer wishes to develop the maximum area at minimal expense and time?
Ethics & Floodplain Management
Developer’s Options

#1 Construct a levee (requires design & construction cost, time, legal effort to establish a LID and results in a loss of developable area)

#2 Fill in the SFHA up to the floodway boundary (better that #1 but results in loss of developable area)

#3 Fill in both the SFHA and floodway and move floodway boundary using CLOMR (allows development of entire site)
Community’s Problems & Requirements

- Evaluate floodway revision request
- Evaluate placement of fill in SFHA and in the regulatory floodway
- Require proper notification of adjacent property owners, NFIP State Coordinator and FEMA
LOMC Ethical Issues

- Developer submitted a LOMR, not a CLOMR, failing to disclose that fill would be placed in the SFHA and floodway attempting to correct errors in the floodway boundary and to bypass the requirement to notify affected property owners (adjacent and across the stream).
- The LOMR appeared harmless because it shows no change in the BFE, floodway width, cross-sectional area, or mean velocity and only required community acknowledgement implying approval of the boundary revision.
- If FEMA approved the LOMR the developer would be free to fill the entire site because it would now be mapped as Zone AE and Zone X and not within the floodway.
- However, the community notified the adjacent property owners who strongly opposed revision of the floodway boundary.
- The community then forwarded the LOMR to FEMA with a recommendation not to approve.
11. Ethical Surveying and Modeling Decisions

- Fact: Cross section selection is an important aspect of floodplain modeling and design.
- Are the cross section locations representative of the conditions in the area?
- Is the cross section spacing adequate?
- Is the cross section too close to nearby structures? (Bridge, dam, drop structure)
- Does the cross section spacing & locations improperly benefit the client?
12. Ethics related to Real Estate Transactions

- Problem: Disclosure requirements
  - Has the property flooded? How many times? Previous NFIP flood claims?
  - Is the property located in the Special Flood Hazard Area?

Ethics:
- Many states require the seller to disclose flood hazard information allowing the Realtor to claim to have no knowledge regarding flood zone and past flooding information.
Conclusions and Thoughts

‘n’ = 0.050 or 0.070? Which is correct? For My client or for city? Who will know?
1. As demonstrated … *technical & administrative issues can easily become ethical issues.*
2. Due to the complexity and diversity in hydrologic and hydraulic problems and methodologies, available software, and the numerous decisions that have to be made, technical issues can often become either ethical issues or differences of opinion.
3. There can be a very fine line between “cheating” on selected parameters and just plain errors in judgment.
4. It is our hope that this presentation provides some food for thought for floodplain managers and other professionals who are making these technical and ethical decisions each time they develop a model, select parameters, survey a cross section, issue floodplain permits, or delineate results for drainage studies and design, LOMCs, or flood insurance studies.
5. It is hoped that this presentation will encourage floodplain managers and engineers to openly discuss the technical design, study, mapping, and floodplain permitting decisions in other related disciplines that can be, in reality, ethical decisions.
And Now a Final Word
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Questions or Comments?
Ethics in Floodplain Management

Texas Floodplain Management Association

Fall Technical Conference
Rockwall, Texas

September 20, 2012

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Ethics & Floodplain Management
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