



AN OVERVIEW OF FLOODPLAIN POLICIES (WITH CONSIDERATION FOR SALMON)

Kevin Coulton, P.E., CFM

cbec, inc. eco engineering

Columbia River Intertribal Fish Commission

Future of Our Salmon Conference

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The Association of State Floodplain Managers

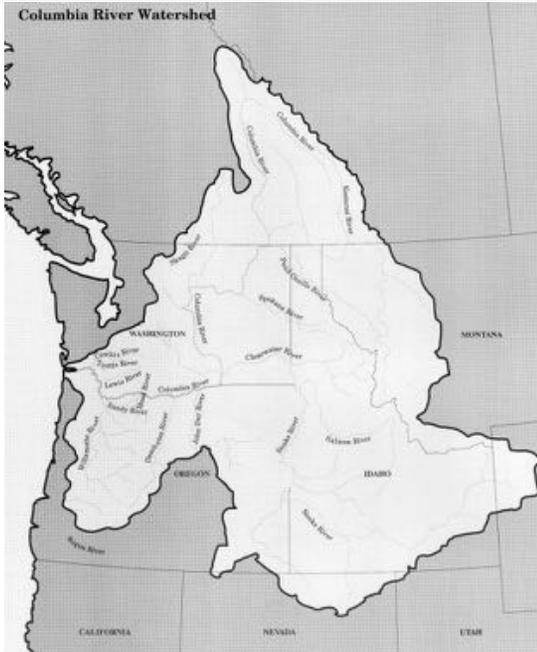
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- ASFPM began more than 45 years ago as a grassroots organization of floodplain managers in the Midwest and now includes more than 16,000 members worldwide.
- Our mission has always been to:
 - help develop and implement national flood policy and programs that reduce damages, human suffering and taxpayer costs of flooding;
 - mitigate the losses, costs, and human suffering caused by flooding;
 - protect the natural and beneficial functions of floodplains.

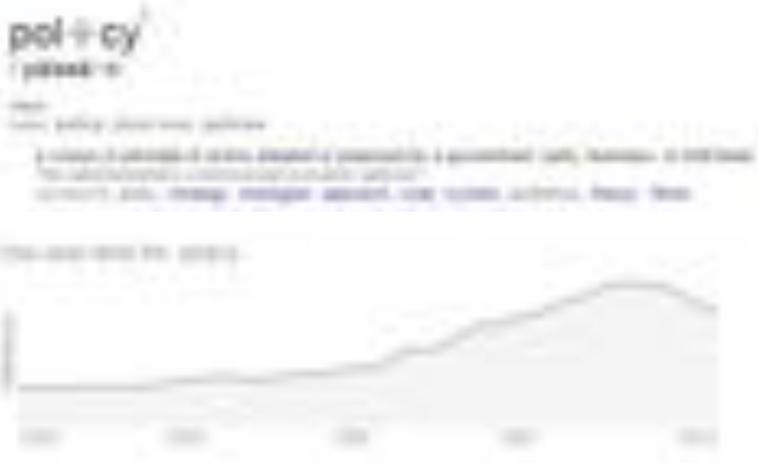




Presentation Overview



- The U.S. National Flood Insurance Program (NFIP)
 - National level
 - Community level
 - Tribal level
- Related policies and legislation
- Flood management in Canada
- Flood risk and risk reduction
- No Adverse Impact (NAI)
- Natural and Beneficial Functions (NBF) of Floodplains
- Future floodplain policy considerations





The National Flood Insurance Program (NFIP)

- The National Flood Insurance Act of 1968 established the NFIP, which has three components: 1) to provide flood insurance; 2) to improve floodplain management; and, 3) to develop maps of flood hazard zones. Subsequent legislation established several goals:
 - Decrease the risk of future flood losses,
 - Reduce the costs and adverse consequences of flooding,
 - Reduce the demands and expectations for disaster assistance after floods, and
 - Preserve and restore the natural and beneficial functions of floodplains.
- How well is the NFIP working?

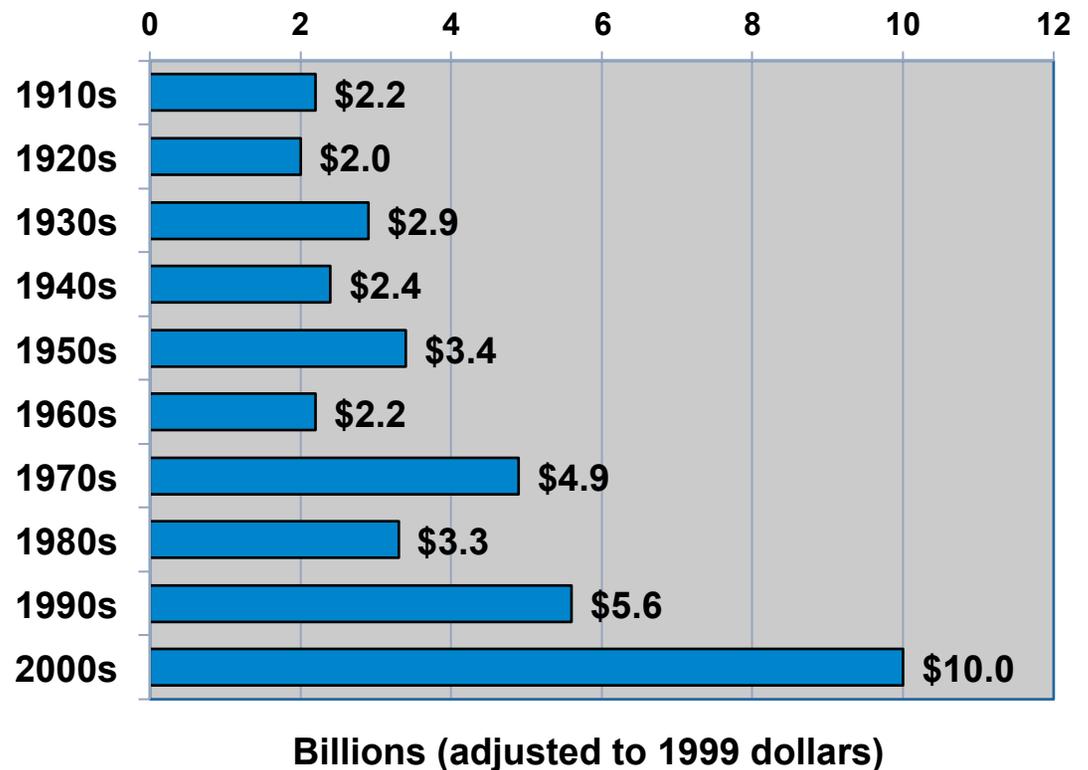




U.S. Flood-Related Statistics

- Over 5.6 million flood insurance policies are in effect.
- Over \$1.2 trillion in insurance coverage.
- Flood losses reached \$10 billion annually by 2010; a 3-fold increase from early 1900s.
- Per capita damages increased by more than a factor of 2.5 in the previous century--in real dollar terms.

Average Annual Flood Damages





Roles and Responsibilities in the NFIP

Role	Responsibilities
Federal	<ul style="list-style-type: none"> The NFIP is managed under the Federal Emergency Management Agency Identify flood risk areas Set National Flood Insurance rates Set standards for construction in floodplains Provide financial backing -- funds can be raised from National Treasury & Congress Provide special mitigation grant programs to assist the NFIP including the Flood Mitigation Assistance (FMA) Disaster Preparedness (DP) and Storm Hazard Mitigation (SHM) programs. Eligible for these programs include all participating NFIP Administer all federal activities for NFIP
State	<ul style="list-style-type: none"> Administer state NFIP operations for participating communities Local governments must be approved by the NFIP and state to participate in program Local governments have operating authority to regulate and enforce floodplain regulations Responsibilities of local governments include: <ul style="list-style-type: none"> - Issuing or denying building development permits - Issuing building permits in accordance with building regulations - Enforcement of a record of building development - Review requests with information of flood hazard, flood stage, flood insurance and floodplain regulations Local governments also participate in flood map update programs Communities must adopt flood management regulations to participate in the NFIP Communities must follow a quality standard
Insurance Industry	<ul style="list-style-type: none"> Set premiums Underwrite
Private Individual	<ul style="list-style-type: none"> Purchase insurance to protect investment Responsibility to follow the National Flood Insurance Code (NFIP) rules

Focus on
"Insurance"

Focus on
"Land Use"

Source: FEMA (2011) and NFIP (2011) (2011) (2011)



The NFIP at the Community Level

- Participation in the NFIP is voluntary.
- FEMA provides a community with flood hazard information to guide their development of floodplain regulations.
- For insurance coverage, communities must adopt a floodplain management ordinance that meets or exceeds the minimum standards of the NFIP.
- Higher standards have been developed and many of these can be applied to protect the natural and beneficial functions (NBF) of floodplains and help conserve or protect salmon habitat.





The NFIP at the Tribal Level

- FEMA recognizes the government-to-government relationship between the U.S. government and federally recognized tribes.
- Indian tribes...are considered communities by the National Flood Insurance Program (NFIP) and can join the program.
- FEMA consults with tribes to ensure that FEMA policies and programs address tribal needs.
- An updated Tribal Policy [FP 305-111-1] will supersede the current FEMA Tribal Policy, issued in 2013, which expires on December 30, 2016. Tribal officials can submit comments on the FEMA Tribal Policy until October 28, 2016.



Executive Orders Influencing the NFIP

- A rule or order issued by the president and having the force of law.
- E.O.11296 - Evaluation of Flood Hazard in Locating Federally Owned or Financed...Facilities (1966, pre-NFIP)
- E.O. 11988 – Floodplain Management (1977)
- E.O. 13690 –Establishing a Federal Flood Risk Management Standard (2015)





Executive Order 13690 - Federal Flood Risk Management Standard (2015)

- Where possible, an agency shall use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration
- The floodplain shall be established using one of the following approaches:
 - An elevation using data and methods informed by best-available, actionable climate science;
 - An elevation two feet above the 100-year (1%-annual-chance) flood elevation for standard projects, and three feet above for critical buildings like hospitals and evacuation centers; or
 - The area based on the 500-year (0.2%-annual-chance) flood elevation.
- ASFPM is concerned that FEMA's rules to implement the standard do not emphasize the avoidance of flood hazard areas (10/3/16).



The NFIP and the ESA – FEMA Region 10



- NMFS issued Biological Opinions on the impact of the NFIP on listed species, including salmon, in WA (2008) and OR (2016).

Floodplain Management and the Endangered Species Act
A Model Ordinance
November 2013



Floodplain Habitat Assessment and Mitigation
Regional Guidance for the Puget Sound Region
2013



Floodplain Management and the Endangered Species Act Checklist for Programmatic Compliance

November, 2013



- Guidance available for local communities to implement the NFIP and be compliant with the ESA.



NFIP Programmatic Environmental Impact Statement (PEIS)

- NEPA requires Federal agencies to evaluate potential environmental impacts as part of their planning process.
- Work on the PEIS began in 2012 and the purpose is to reduce unsound development in the floodplain and protect environmentally sensitive areas.
- FEMA intends to implement modifications to the NFIP.
- A range of reasonable alternatives will be considered for modifying the primary elements of the NFIP; i.e., floodplain management, mapping, and insurance.





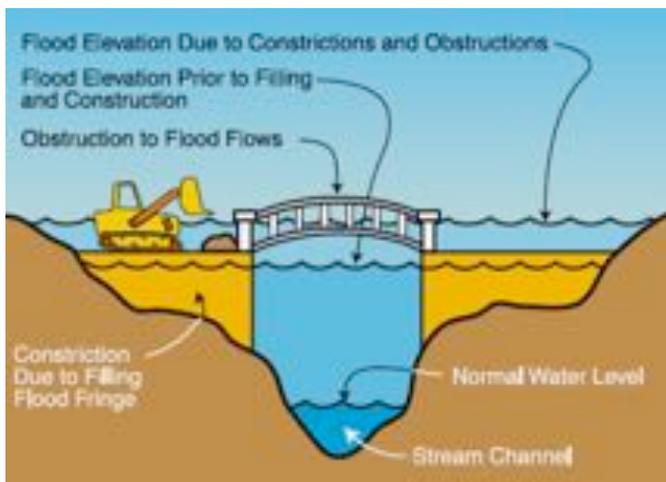
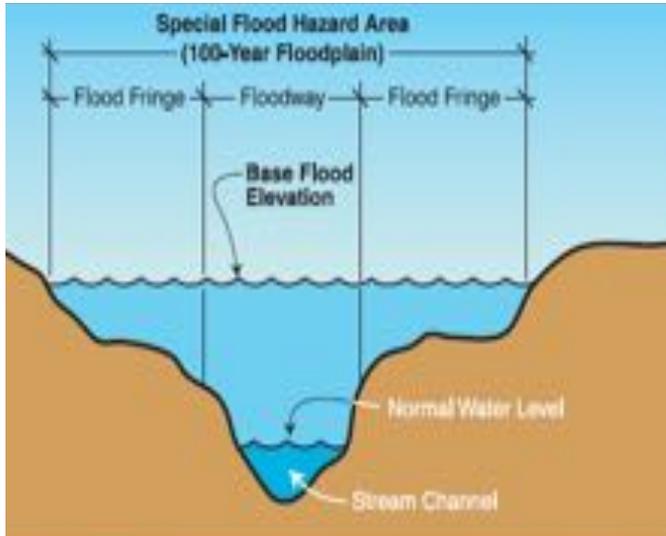
NFIP Evaluation Mandate



- 1968 - In passing the National Flood Insurance Act, Congress intended the NFIP to be continually re-appraised for its effects on land use.
- 1973, 1976, 1982 - Sporadic evaluations for varying reasons.
- 1983 - Presidential Task Force on Regulatory Relief concluded standard ok.
- 1999 – FEMA initiated effort for first comprehensive evaluation of the NFIP.
- 2006 – Final reports published.



NFIP Evaluation Findings Related to Natural and Beneficial Functions of Floodplains



- About 9,000 square miles of flood-prone lands are delineated as floodways and protected from future development (2002).
- The conveyance function of floodplains is protected (e.g., the floodway), most others are not.
- The map revision process (e.g., LOMR-Fs) and other NFIP criteria indirectly promote the filling and channeling of the floodplain.
- The NFIP has not emphasized the protection of NBF and has few tools to help restore them, once they are impaired.



NFIP Evaluation Recommendations Related to Natural and Beneficial Functions of Floodplains

- Revise NFIP flood hazard mapping criteria to identify natural functions worthy of preservation.
- Account for the environmental impacts and cumulative effects of fill from LOMR-Fs on floodplain NBFs.
- Develop a map product that allows delineation of floodplains associated with more frequent flooding and having a higher ecological value.
- Evaluate shortcomings of the regulatory floodway; e.g., reliance on existing land use, steady flow assumption.
- Incorporate the economic value of floodplains into current benefit-cost analyses.





Recent Flood Insurance Legislation

- The Biggert-Waters Flood Insurance Reform Act of 2012 (BW-12)
 - Authorized and funded the national mapping program and certain rate increases transitioning the program from subsidized rates (i.e., artificially low rates) to offer full actuarial rates
- The Consolidated Appropriations Act of 2014
 - *Repealed certain parts of BW-12*
- Homeowner Flood Insurance Affordability Act of 2014
 - *Repealed certain parts of BW-12*
 - Exempts mapping fees for flood map changes due to habitat restoration projects
 - Requires FEMA to consider the effects of non-structural flood control features, such as dunes, and beach and wetland restoration when it maps the special flood hazard area



The 2017 NFIP Reauthorization

- The NFIP is set to expire on 9/30/2017 unless a bill to continue the program is passed through both the House and Senate.
- The NFIP has accumulated significant debt in recent years; as of 2015, NFIP owed the U.S. Treasury \$23 billion. Due to this, some Members of Congress have suggested eliminating the program in its entirety and moving toward private insurers as the sole source for flood insurance.





Flood Management in British Columbia

“Province”

Ministry or Organization	Program/Project	Description
Ministry of Environment and Climate Change	Water Stewardship Program	• Create and sustain British Columbia's water resources for the future.
	Water Stewardship Program	• Provide local governments with technical information and training needed to improve floodplain development practices.
	Water Stewardship Program	• Provide technical assistance to local governments and First Nations.
	Water Stewardship Program	• The regulatory framework for water management under the Canada BC Water Agreement, 1988 and 2006.
Ministry of Public Safety and Emergency Services	Emergency Management BC	• This coordination program provides advice and funding to develop emergency plans and procedures for various types of disasters.
	Provincial Emergency Program (PEP) (Emergency Management BC)	• This program provides advice and funding to help municipalities respond to flooding.
	Provincial Emergency Program (PEP) (Emergency Management BC)	• Provide information to local governments for an additional source of funding from all levels of government.
Ministry of Infrastructure and Economic Development	Provincial Flood Protection Program (PFPP)	• Administer the Flood Protection Program, which is a partnership between the federal and provincial governments, working through the British Columbia Flood Protection Council (BCFPC) for assistance for flood control projects, of which they will provide 10% of the funding, and the provincial and federal governments will provide 40% each to cover remaining costs.
	Provincial Flood Protection Program (PFPP)	• This program provides assistance to communities where flood protection works are needed.

“Basin”

Flood Basin Council	• The Flood Basin Council is a non-government, not-for-profit organization that provides assistance for projects that protect environmental and living of the Flood Basin.
Flood Basin Council	• The Council is the primary facilitator of flood management in the Basin.
Flood Basin Council	• Coordinate all emergency and information dissemination regarding flood risk in the Basin.
Flood Basin Council	• Support government flood management work.

Source: British Columbia Flood Protection Program, 2014. BC Flood Protection Program, 2014. BC Flood Protection Program, 2014.



Policies that Contribute to Increased Flood Risk

Federal Policies

- NFIP & the 100-Year Standard
- Emphasis on structural approaches
- Disaster relief environment

States & Communities

- Control land use for short-term benefits
- Perceive flooding to be a federal problem
- Externalize the costs & consequences

Public

- Unaware of – or unwilling to accept - residual risk
- Misplaced concern about having to obtain flood insurance



How to Reduce Flood Risk

- Avoid development of high risk areas
 - Through planning and wise land use.
 - Retreat from highest risk areas, elevate or protect in lower risk areas.
 - Use high risk areas for open space, which can pay for itself with increased value.
- Apply higher NFIP standards
 - Map future floods, not Yesterday's flood.
 - Avoid cumulative flood rise—no floodway development.
 - Increase freeboard for new buildings above flood level.
 - Critical Facilities—must be accessible and operable during the 500 year flood event.
- Use natural systems to reduce flood risks
- Implement No Adverse Impact (NAI) principles



No Adverse Impact (NAI) and the NFIP

- No Adverse Impact (NAI) is a development approach that ensures that the action of any community or property owner, public or private, **does not adversely impact the property and rights of others.**
- The true strength of the NAI approach is that it encourages local decision making to ensure that future development impacts will be identified, considered on a watershed-wide basis and mitigated.
- NAI is built on and is a further extension of the philosophy of the NFIP.





How to Implement NAI?

- Adopt higher NFIP standards tied to public safety and tailored to community and ecological needs.
- Identify ALL the impacts of a proposed development anywhere in watershed.
- Notify potentially impacted property owners and communities of the impacts of any proposed development.
- Mitigate impacts before developing.
- Provide points for FEMA Community Rating System (CRS) Program, to reduce flood insurance premiums.





NAI Benefits

- Guides the actions of communities and property owners to not adversely impact other properties or ecosystem resources.
- Incorporates multi-objective-management and watershed planning principles.
- Reduces future flood damages and the community's liability and legal challenges.
- Provides for more sustainable and resilient community.
- Protects natural and beneficial functions of the floodplain.





Natural and Beneficial Floodplain Functions - Definition

- The National Flood Insurance Reform Act of 1994 defines the term 'natural and beneficial functions' (NBF) as:
 - (A) the functions associated with the natural or relatively undisturbed floodplain that (i) moderate flooding, retain flood waters, reduce erosion and sedimentation, and mitigate the effects of waves and storm surge from storms, and (ii) reduce flood related damage; and
 - (B) ancillary beneficial functions, including maintenance of water quality and recharge of groundwater, that reduce flood related damage.





Natural and Beneficial Floodplain Functions – Ecosystem Services

Natural and Beneficial Resources and Functions of Floodplains

Natural Flood & Erosion Control

- Provide flood storage and conveyance
- Reduce flood velocities
- Reduce flood peaks
- Reduce sedimentation

Water Quality Maintenance

- Filter nutrients and impurities from runoff
- Process organic wastes
- Moderate temperature fluctuations

Groundwater Recharge

- Promote infiltration and aquifer recharge
- Reduce frequency and duration of low surface flows

Biological Productivity

- Support high rate of plant growth
- Maintain biodiversity
- Maintain integrity of ecosystem

Fish and Wildlife Habitat

- Provide breeding and feedings grounds
- Create and enhance waterfowl habitat
- Protect habitats for rare and endangered species

Harvest of Wild & Cultivated Products

- Enhance agricultural lands
- Provide site for aquaculture
- Restore and enhance forest lands

Recreational Opportunities

- Provides areas for active and passive uses
- Provide open space
- Provide aesthetic pleasure

Areas for Scientific Study and Outdoor Education

- Contain cultural resources (historic and archaeological sites)
- Provide opportunities for environmental and other studies

(Federal Interagency Floodplain Management Task Force, 1994, p. 41)

- “...floodplains were the second ranked ecosystem type, behind only estuaries, in terms of their per-hectare value to society.
- Despite representing <2% of Earth's terrestrial land surface area, floodplains provide approximately 25% of all terrestrial ecosystem service benefits.”
- Opperman, Jeffrey, Luster, Ryan, et.al. 2010. Ecologically Functional Floodplains: Connectivity, Flow Regime, and Scale. Journal of the American Water Resources Association 46(2): 211-226.



Natural and Beneficial Floodplain Functions - Ecosystem-Based Functions

- Coalition of Columbia Basin Tribes (2013) - Since time immemorial, the rivers of the Columbia Basin have been, and continue to be, the lifeblood of the Columbia Basin tribes. A restored, resilient and healthy watershed will include ecosystem-based function such as:
 - Increased spring and summer flows resulting in a more natural hydrograph.
 - Restoring and maintaining fish passage to historical habitats.
 - Higher river flows during dry years.
 - Lower late summer water temperature.
 - Reconnected floodplains throughout the river.
 - An adaptive and flexible suite of river operations responsive to a great variety of changing environmental conditions, such as climate change.



Future Floodplain Policy Considerations - Look to Other Countries?

Table 14:
ZÜRS flood hazard zones

Flood insurance is not offered within the 10-year (10% annual chance) floodplain in Germany.

Zone	Hazard	Average statistical flood return period	Current insurability
I	Very low	>200 years	Insurable
II	Low	50–200 years	Insurable provided that enough accumulation cover exists and some mitigation action has been taken by owner
III	Moderate	10–50 years	Uninsurable
IV	High	<10 years	Uninsurable

Source: Thieken et al., 2006 adapted from Kron, 2003

Table 15:
UK Flood Zones

Development should only be permitted in Zone 3 when there is no non-flood vulnerable site available, and the benefits of such development outweigh the flood risk.

Zone	Classification	Return Period/Flood Probability
1	Low probability	Lands that have less than a 1 in 1000 year flood probability (<0.1%)
2	Medium probability	Lands having between a 1 in 100 year and 1 in 1000 year probability of riverine flooding (1%–0.1%) or Lands that have between a 1 in 200 and 1 in 1000 year probability of sea flooding (0.5%–0.1%)
3a	High probability	Lands have a greater than 1 in 100 year probability of riverine flooding (1%) or Lands that have a greater than 1 in 200 year probability of sea flooding (0.5%)
3b	The functional floodplain	Lands where water flows or must be stored during a flood. These lands may have a flood probability greater than 1 in 20 years (5%), or may be designed to convey water during an extreme flood event (e.g., a 1 in 1000 year flood). Local governments may work with higher levels of government to identify these areas.

Source: Communities and Local Government, 2006

Consider Economic Trends to Guide Future Policies

Figure 7
Corps of Engineers' Outlays for Construction of
Flood Control Works, 1960-1987

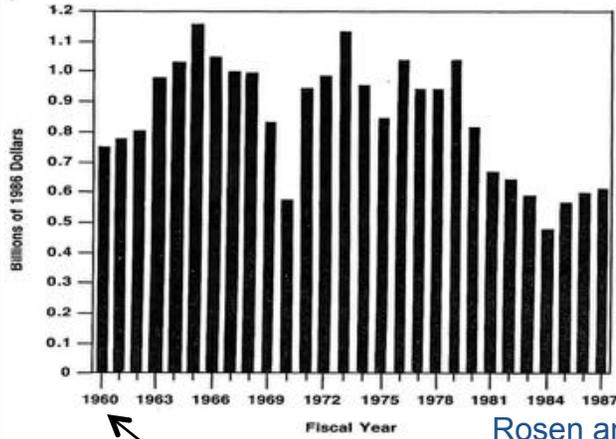
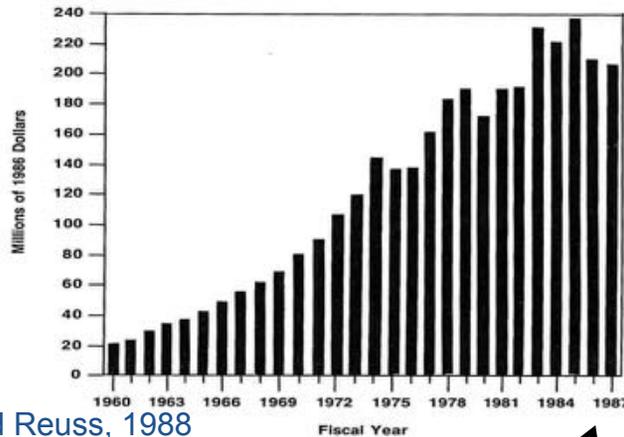
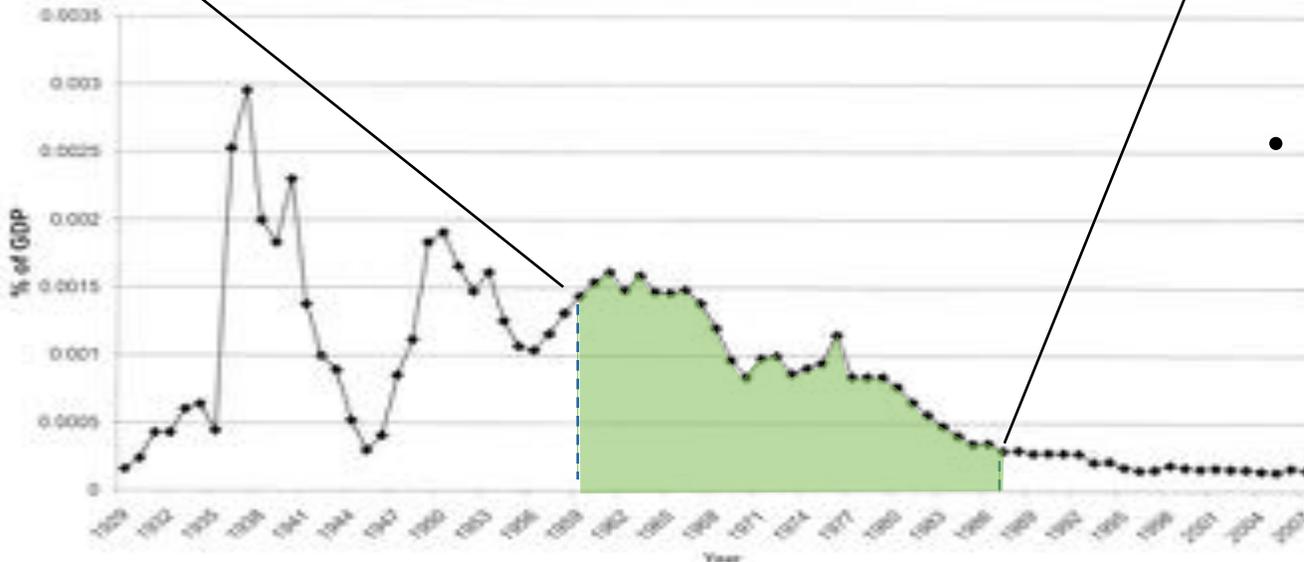


Figure 8
Corps Engineers' Outlays for Operation and Maintenance of
Flood Control Works, 1960-1987



Rosen and Reuss, 1988

Civil Works Capital Investment as a Percentage of GDP



- We tried to control flooding.
- Human flood losses are increasing.
- Investments in flood control infrastructure is decreasing.
- O&M costs of flood control infrastructure is increasing.
- Perhaps it is time to prioritize a “principle of action” to protect and restore the natural and beneficial functions of floodplains...for the benefit of all species.

Civil Works Data Sources: 1929-2000 data from Rob Wring, June 22, 2001 presentation; 2001-2007 data from the Corps of Engineers construction budget. The data does not include emergency supplemental funding (e.g., funding for Hurricane Katrina-related repairs and improvements). GDP Data Sources: Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.5, Gross Domestic Product; Adjusted using the GDP deflator from the Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.4, Price Indexes for Gross Domestic Product.



Thank You!

“Floods are ‘Acts of God’, But Flood Losses Are Largely Acts of Man”

**Dr. Gilbert White
(1942)
“The father of
floodplain
management”**



Please visit the ASFPM website for more floodplain policy information
www.floods.org