



Floods of 2008

Urban Systems

Wayne Petersen, Urban Conservationist, IDALS



What lessons did we learn? (or should have learned)

- 100 year storms and 100 year floodplains are not a good standard for the future
- Past weather patterns are not good models for the future ("Stationarity" is dead)
- We must consider the "hydrologic footprint" of our actions
- We must find ways to increase the landscapes capacity to hold water and shed less runoff
- We should stay out of the flood plains (?)



What do we know already?



Dr. Gene Takle and Dr. Elywnn Taylor - ISU

- Getting 10% more rain than we used to
- More rain earlier in the year – more runoff.
- Getting more days when it rains
- Getting more days with big rains
- In 2007 – 8 days with more than 4" of rain
- In 2008 – probably more than that



Dr. Jerry Miller - ISU

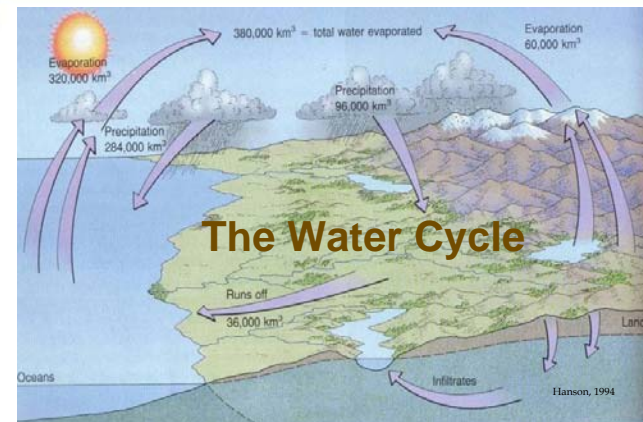
- Degradation of soil quality (loss of OM)
- Bulk density increased (compaction / less pore space)
- Less infiltration – more runoff
- SQ degradation correlates to LDA (urban) or tillage (ag)
- Need to **improve soil quality** in both urban and ag sectors – the easiest, cheapest, fastest way to help landscapes hold more water and reduce the volume of runoff.

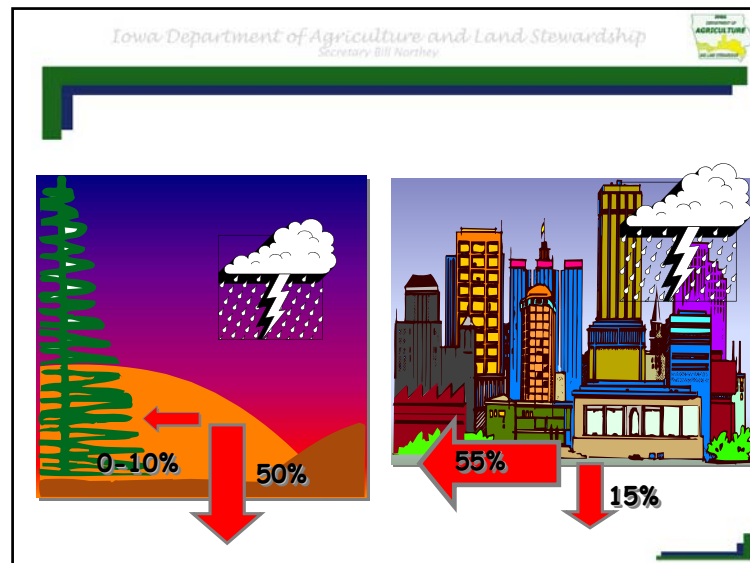


"Stationarity"

"In a recent article in Science magazine, hydrologists and engineers commented that a central tenet of civil engineering called "stationarity" – the notion that water systems can be designed and managed for a relatively stable range of conditions – is no longer true."

Betsy Otto,
American Rivers

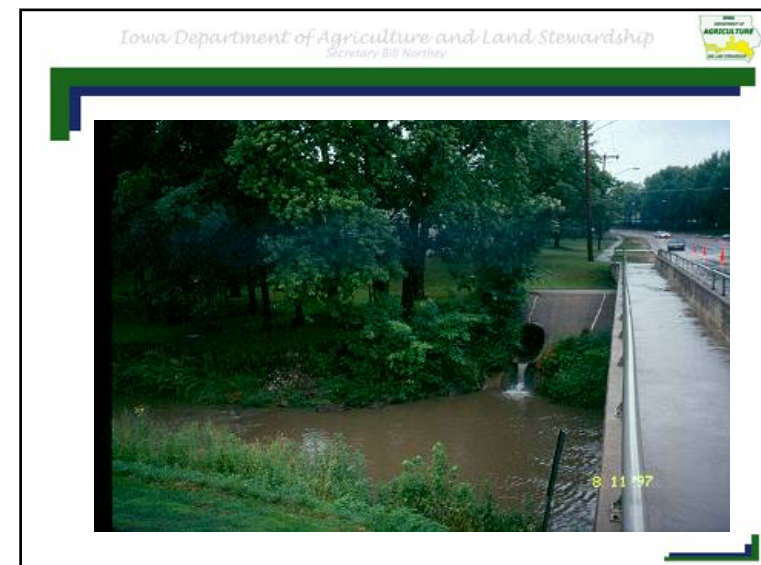
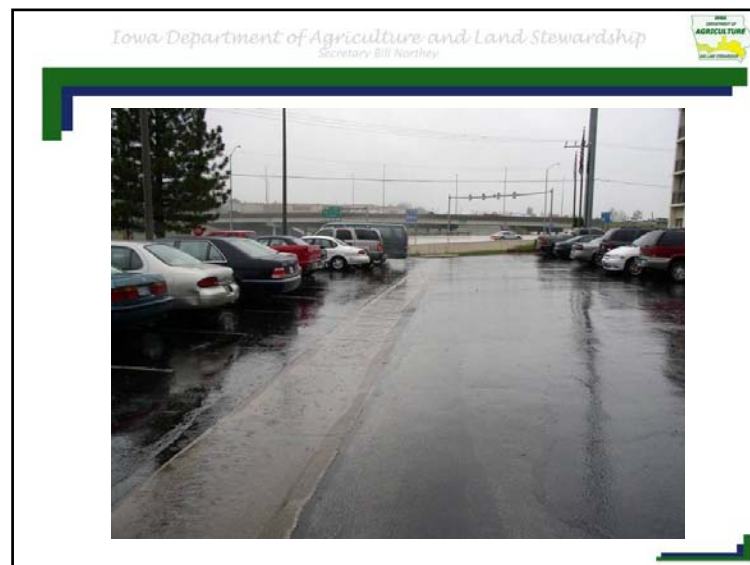


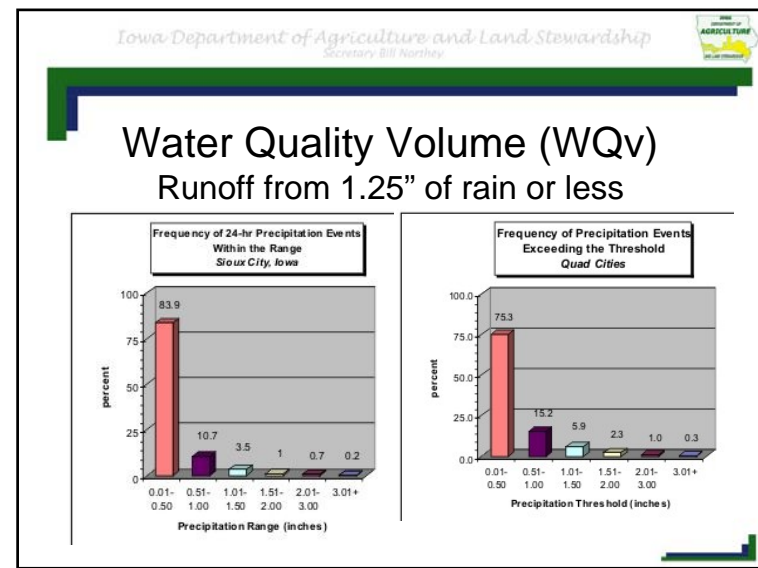
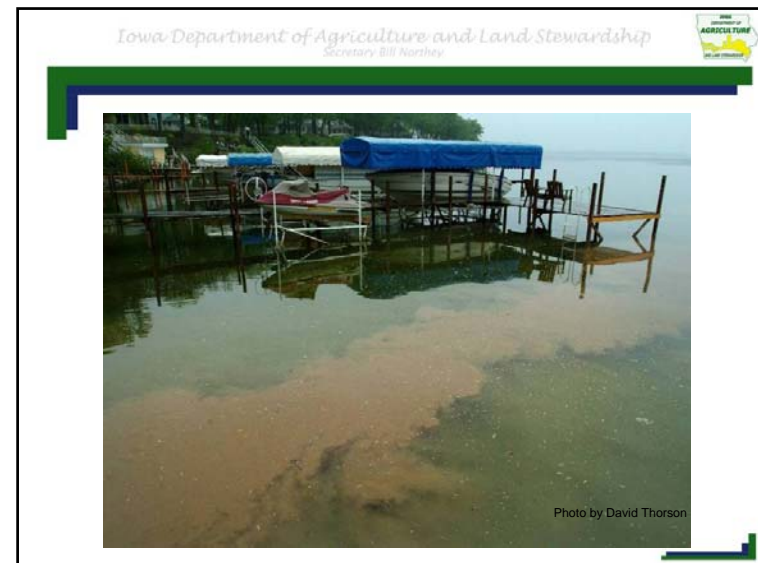
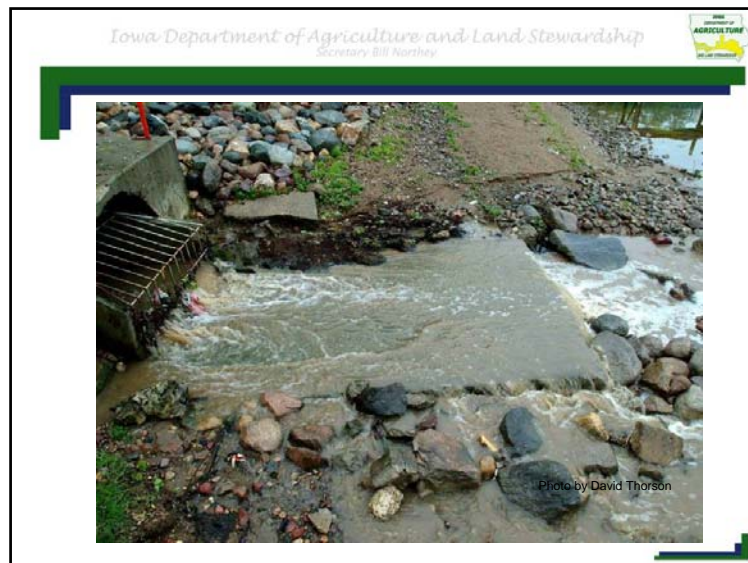


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Secretary Bill Northey

What can we apply now?

The New Paradigm:
Storm Water Management
for
WQ / WQ







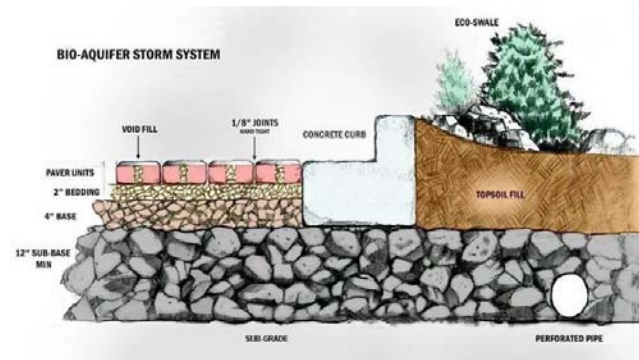
Infiltration-based storm water management practices

- Permeable pavement
- Soil quality restoration
- Bio-retention



Permeable transportation surfaces (60%-70% of imperviousness)

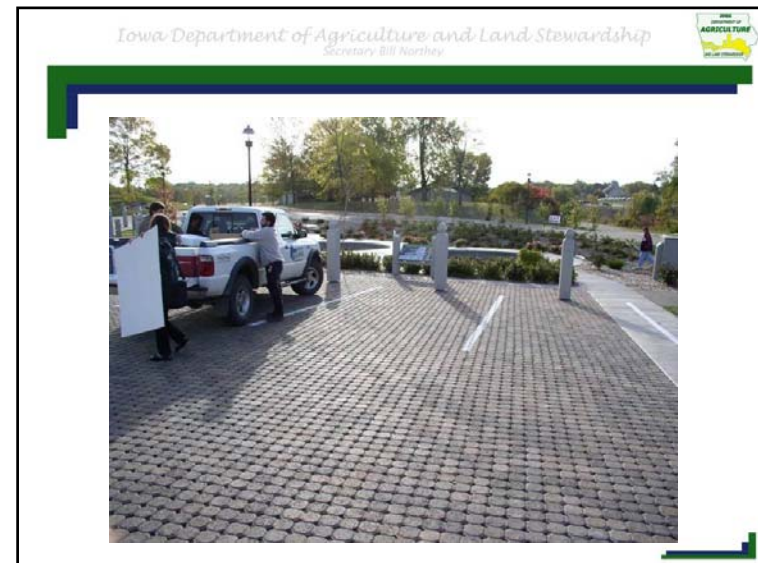
Porous Asphalt
Pervious Concrete
Grass pave systems
Gravel pave systems
Permeable Paver Blocks

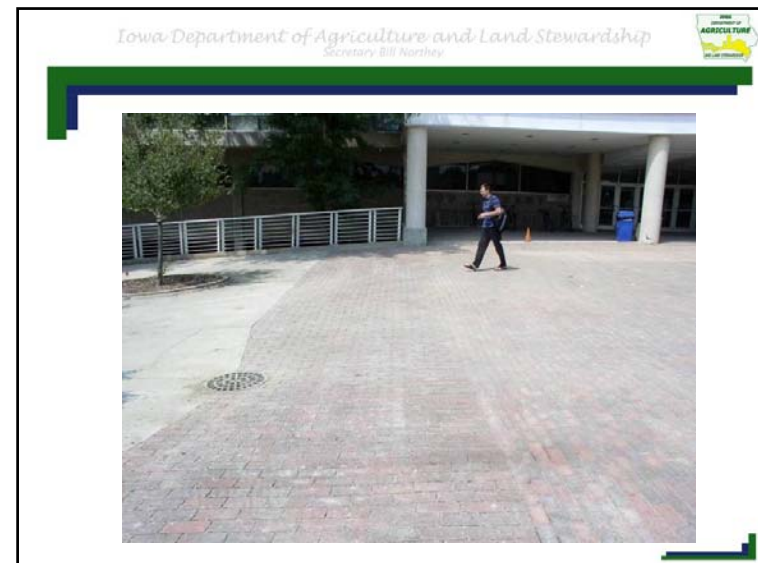




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Permeable Pavers





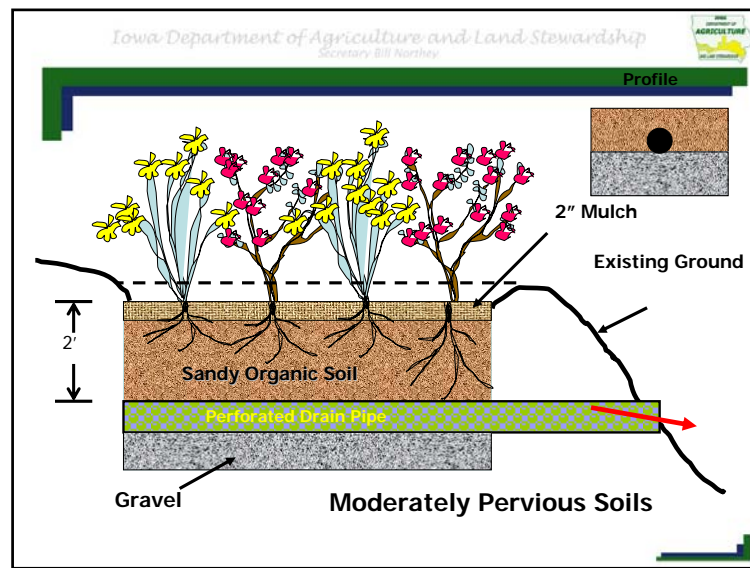
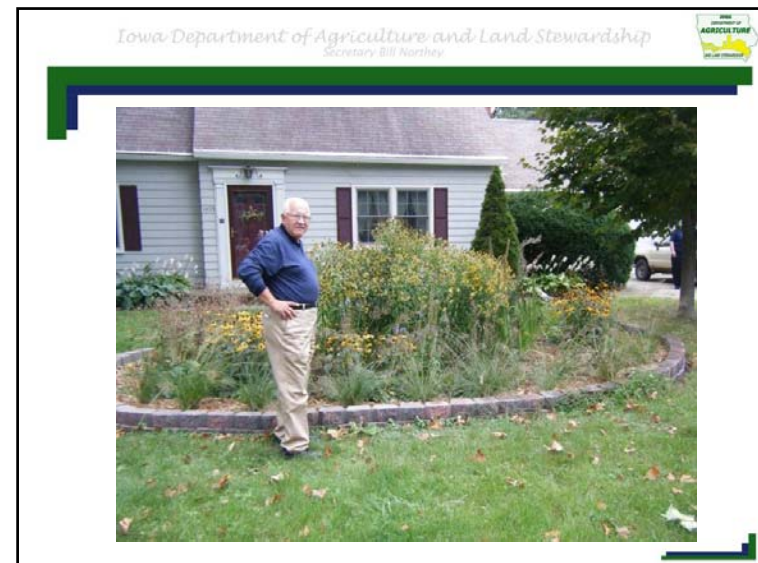


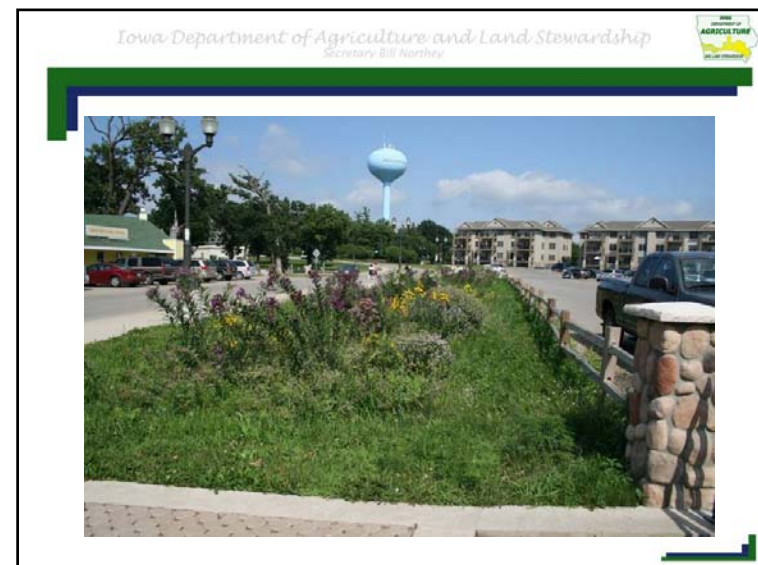
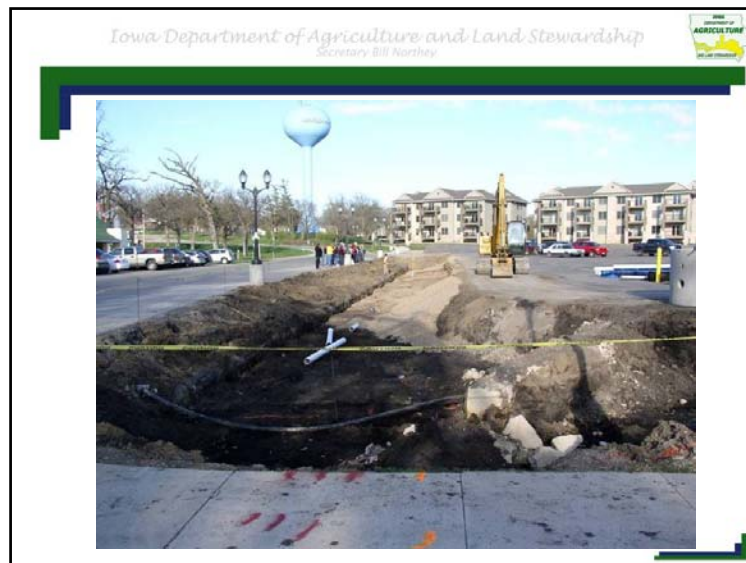


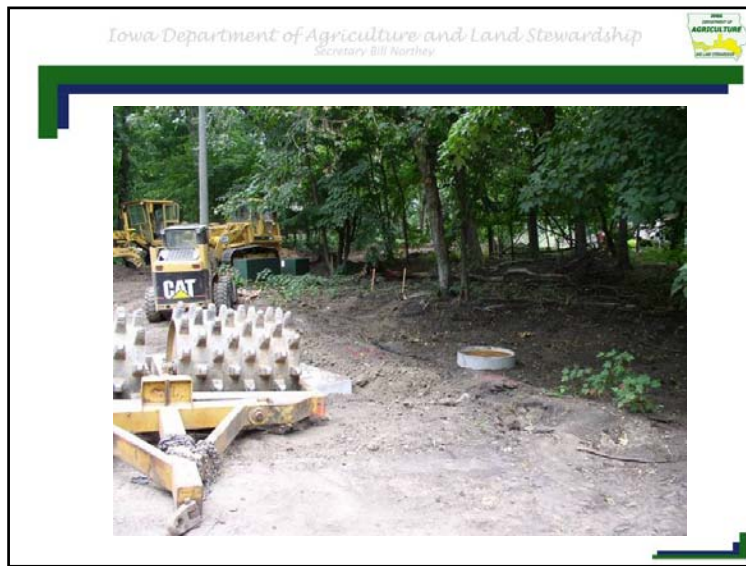
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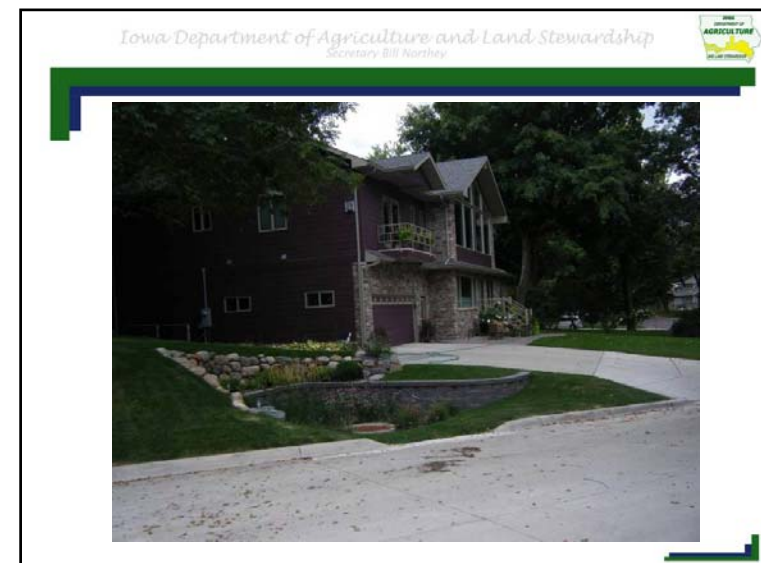
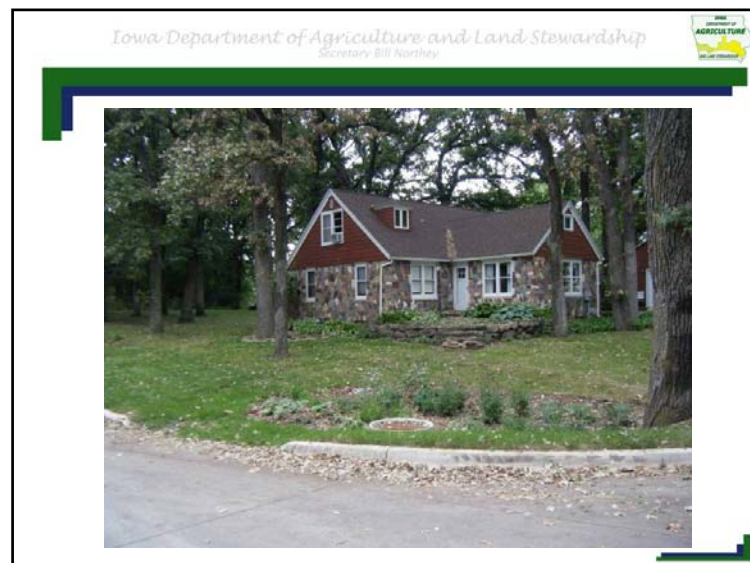
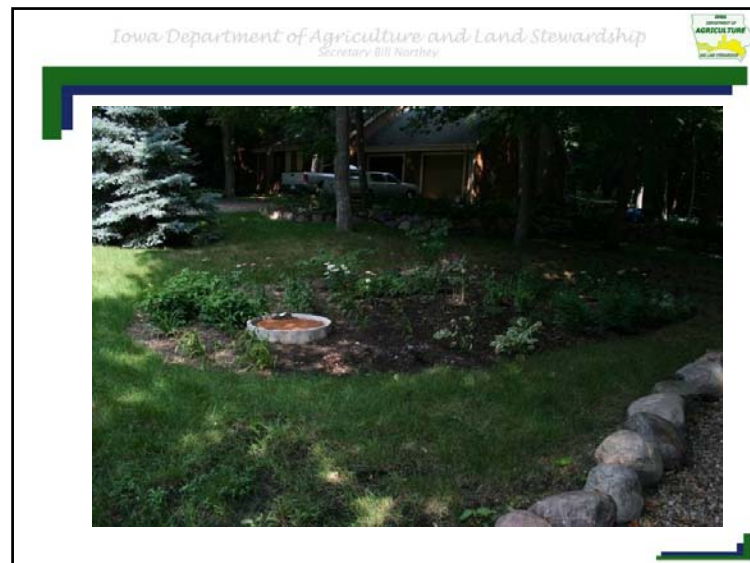
Bio-retention

(Infiltration Cells)







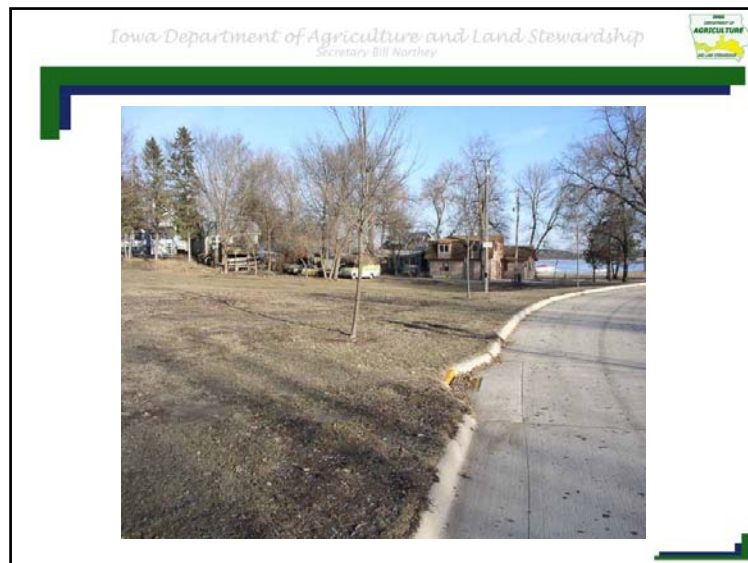




Retrofitting the Built World







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What additional research is needed?

- What is the actual contribution of urban runoff to peak flows?
- How effective are infiltration based BMP's are addressing WQ/WQ...how much could we reduce peaks?
- How much can we downsize traditional infrastructure with LID?
- We need tools to assess urban WS's and model impacts future growth with LID or without LID.

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Wayne Petersen
Urban Conservationist
IA Dept of Ag and Land Stewardship

515-281-5388 (o)
319-430-7480 (c)
wayne.petersen@iowaagriculture.gov



Iowa City's Flood of 2008

Regenia D. Bailey, Mayor
Jeff Davidson, Director
Department of Planning & Community Development

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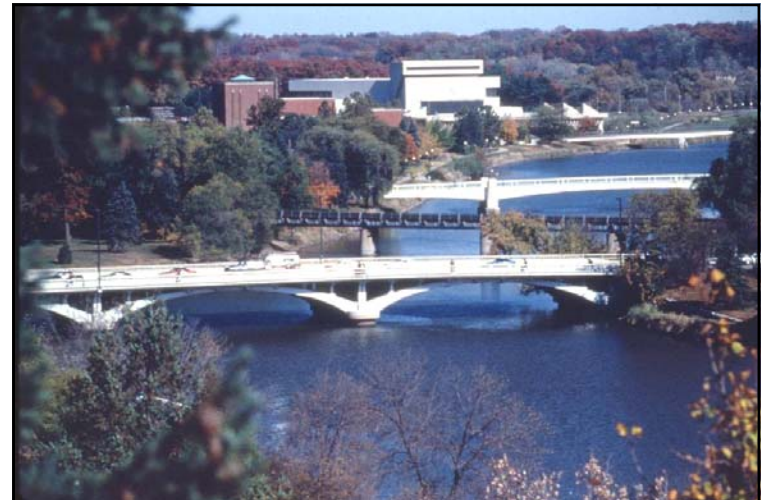
Coralville Dam and Spillway

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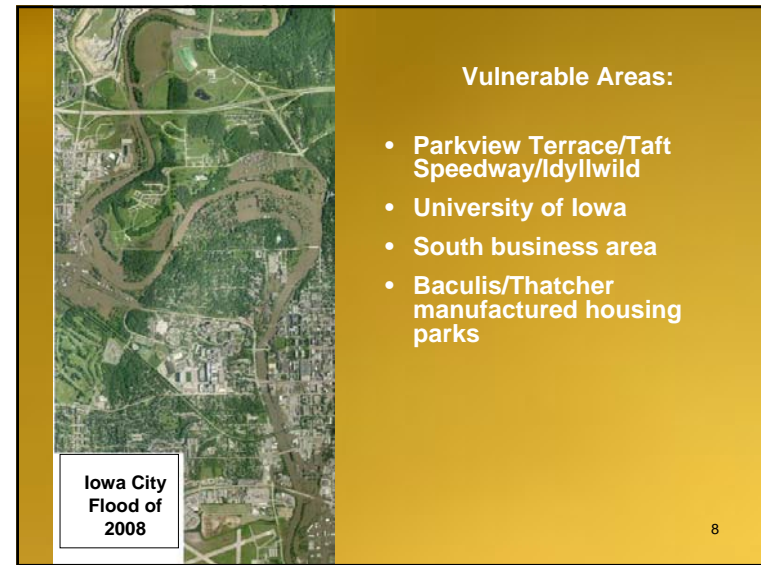
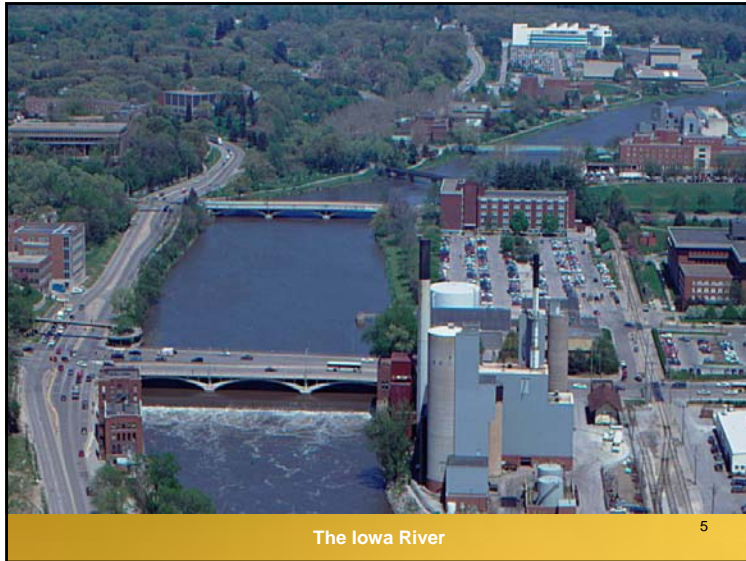
The Iowa River

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The Iowa River

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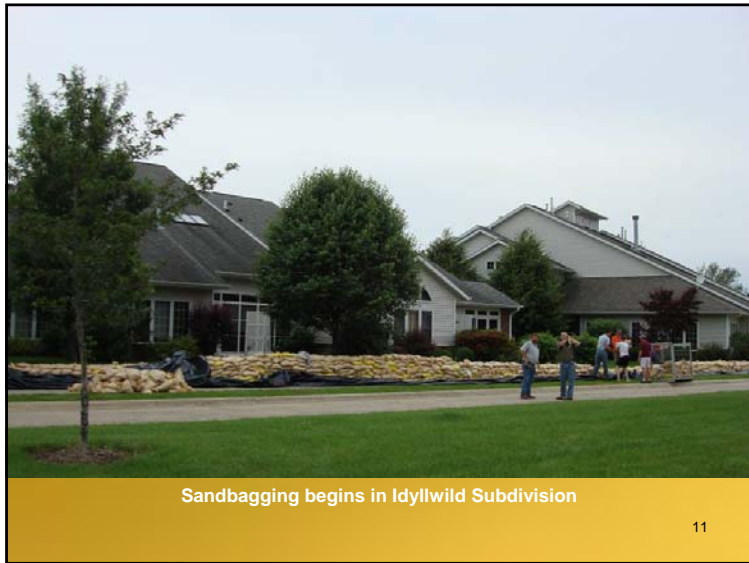




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Sandbagging begins in Idyllwild Subdivision

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June 5, 2008
Dubuque Street is closed

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June 10, 2008
Water flows over the spillway at Coralville Reservoir

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June 10, 2008
Park Road Bridge is closed

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June 12, 2008
Sandbagging ceases; mandatory evacuations begin

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June 13, 2008
Hwy. 6 between Gilbert Street and Riverside Drive closed
33,000 vehicles per day

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June 15, 2008
Flood Crest: 42,500 cfs

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June 15, 2008
Flood crest

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Flood crest

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City Park

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City Park

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Parkview Terrace Neighborhood

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Idyllwild Subdivision

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University of Iowa's Arts Campus

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Businesses south of Hwy. 6

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North Wastewater Treatment Plant; Animal Shelter

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The Idyllwild Neighborhood – issues with condo association

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2008 Flood Flows

Date	@ Hydraulics Lab (cfs)
Normal June 3500 cfs	
June 6	13400
June 9	19100
June 10	21400 Water over Spillway
June 11	22100
June 13	34100
June 14	39700
June 15	42500 Crest
June 23	21000 No Water over Spillway
July 7	12000
December 8	1800

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By the Numbers

- 100 year flood event: 29,000 cfs
- 500 year flood event: 45,000 cfs
- Peak flow in Iowa City: 42,500 cfs on June 15th
- Days above flood stage: 32

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By the Numbers

- Homes inundated: 250
- Businesses impacted: 100
- University of Iowa:
 - 20 buildings flooded
 - \$230 million in damage
 - 1000 unit residence hall evacuated

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By the Numbers

- Acres flood in Iowa City: 1,600
- Total number of calls handled by the Call Center: 8,656
- Sandbags Acquired: 1,593,000
- Sandbags Distributed: 1,393,000

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Recovery

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Water recedes; cleanup begins

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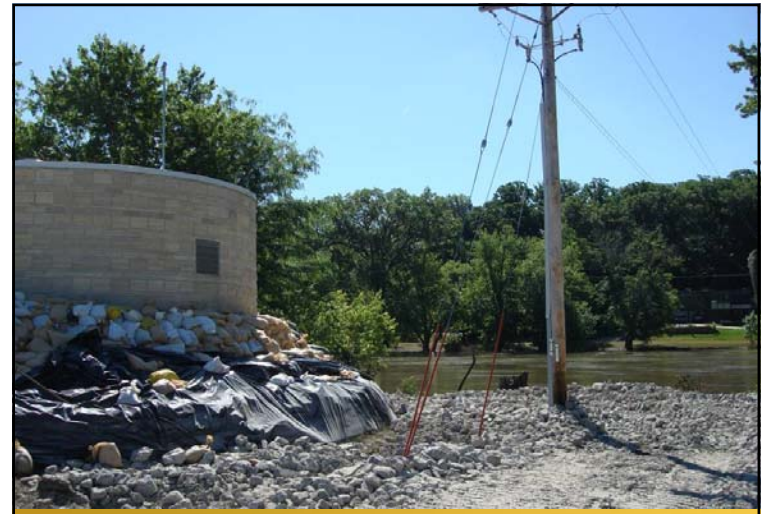


Parkview Evangelical Church

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Water Treatment Plant well field (plant not impacted; relocated after '93)

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City Park: 12,000 tons of sand

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Flood Recovery Call Center

Flood Recovery Center

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Flood Recovery Resource Center

For volunteer matching, call 509 Volunteer City at (319) 397-4637 or email volunteer@iowacity.org

Recent Updates

- Update: 11/21/08: [Letter to Gov. Culver from Mayor Bailey Re: Request to Amend Current ISDG Interpretation Concerning Funding](#)
- Update: 11/21/08: [update to Jumpstart/CDBG applicants from IL Morad](#)
- Update: 11/21/08: [Letter to questioners from D. Purdy Re: H&W](#)
- Update: 11/21/08: [Supplemental CDBG Flood Recovery Funding Process Begins \(posted 10/17/08\) updated 11/13/08](#)
- Update: 11/13/08: "Flood Update" memo from Eleanor Dilley, City Attorney

Supplemental CDBG Flood Recovery Funding Process Begins (posted 10/17/08) updated 11/13/08

Applications are available to apply for Supplemental CDBG Flood Recovery Funding. *If you have already applied for "Jumpstart" funding you do not need to submit another application.*

Applications will be accepted until the Supplemental CDBG funds are depleted. Applications are available at City Hall, Planning Department, 401 E. Washington St, Iowa City. Applications are also available on this webpage - reference the "Jumpstart/CDBG Flood Recovery" box below. Questions regarding the application process or other flood recovery issues can be directed to Naassem Morad, Flood Recovery (319) 356-5479 or rcd@iowacity.org.

To be eligible for this funding, flood impacted residents must have registered for FEMA assistance by calling 1-800-621-FEMA (3662) or go to www.fema.gov to register. The FEMA registration deadline was October 31, 2008.

CDBG Flood recovery funds and levels of assistance are based on federal guidelines. The applicant must:

1. Be the owner of record and have occupied the home as their primary residence during the flood of 2008;
2. Must be at or under 100% of the median income for the City of Iowa City: Single = \$50,000; 2 person household = \$58,000; 3 person household = \$65,000; 4 person household = \$72,000; 5 person household = \$78,000; 6 person household = \$84,000; 7 person household = \$90,000; 8 person household = \$95,000.

At its October 6, 2008, work session, the City Council discussed how to rank the applicants for Jumpstart and CDBG assistance. City Council directed staff to use the system based on weighting criteria that has been employed for many years in making decisions about who will receive CDBG assistance for rehabilitation and home repair. The City's weighting criteria are: elderly, disabled, large family, medium family, and single parent household.

Memo from City Attorney re: Jumpstart/CDBG Weighting Criteria (11-5-08)

Jumpstart Applicant List (weighted rankings) (rev. 11-12-08)

Change address or other contact information? Be sure to let us know at rcd@iowacity.org so we can keep your information up to date.

Iowa City Flood Recovery Updates

(posted 6/29/08): **Mortgage Counseling Service Available** - For residents having difficulty paying their mortgages on flood damaged properties, the State of Iowa is encouraging homeowners to call the Iowa Mortgage Help (IMH) hotline at 877-622-4666. An IMH counselor will gather basic data and will refer callers' cases to one of 17 Iowa counseling agencies. The certified counselors will gather more in-depth financial information and may contact the loan servicer to negotiate a payment schedule depending on each homeowner's situation.

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Jumpstart Iowa

Residential

- State - \$686,197
- CDBG - \$1.2 million

Business

- State - \$1,479,632
- CDBG - \$739,000

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Programs

- Down payment Assistance
- Mortgage Assistance
- Housing Rehabilitation
- Business Assistance

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Mitigation

HMGP Buyout

Future Projects - options

- Elevating Roads and Bridges
- Hesco Barriers
- Levee/Demountable Walls

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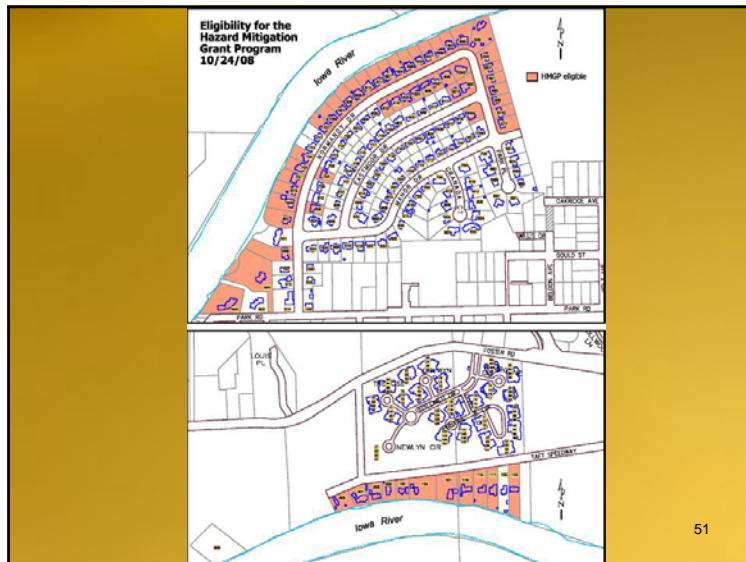
Hesco Barriers

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Demountable flood wall

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Floodplain Management Standards

- Iowa City has adopted the State standard: Elevate structures 1' above the 1% per year occurrence event
- Federal standard is to elevate to the 1% per year occurrence event

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1. Key Question:
What lessons can we learn from the flood?

- Floodplains will become inundated
- Recent history is not adequate when assessing risk
- Floodplain management that deals only with 1% occurrence event (100 yr. flood) is not enough

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1. Key Question:
What lessons can we learn from the flood?

- “100 year” floods can reoccur in 17 years
- The watershed is changing
- The reservoir will not protect us

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2. Key Question:
What do we already know that we can put to practice to reduce the impact of future floods?

- Buyout 100 year floodplain/floodway structures
- Flood proofing (flood doors; alarms)
- Elevate mechanical systems, electrical and plumbing systems and habitable areas above the 100 year floodplain

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2. Key Question:
What do we already know that we can put to practice to reduce the impact of future floods?

- Design ground floors of buildings for inundation (Boat House; Ned Ashton House)
- Elevate additions to buildings in floodplain

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3. Key Question:
What more do we need to learn?

- What is magnitude of '93 and '08 events?
- What is going on in the watershed – increased runoff rates
- What are the hydrologic effects upstream and downstream of flood mitigation strategies?

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3. Key Question:
What more do we need to learn?

- Can the management of the reservoir be improved?
- How can we protect what is left?

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Dubuque Street / Park Road Bridge
Elevation



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North Wastewater Plant relocation

60



Management of Coralville Reservoir

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New Joint Transit Facility for Coralville Transit, Iowa City Transit
and University of Iowa Cambus

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