

Adapting to Weather Extremes: The Economic Impact in Iowa

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CLIMATE CHANGE IMPACTS ON IOWA

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Economic Impacts of the 2008 Floods in Iowa

Eathington, Liesl; Swenson, David A June 2008

Evaluating Direct and Indirect Economic Outcomes of the 2008 Iowa Weather-Related Disasters

Swenson, David A.; Eathington, Liesl August 2010

Anticipating Economic Impacts of the 2012 Drought

Swenson, David A.; Eathington, Liesl August 2012

Investigating Iowa's Industrial Vulnerability to Reductions in Water Resources

Swenson, David A.; Eathington, Liesl April 2013

Determining the Tourism Related Impacts Associated with the 2011 Missouri River Flood in Western Iowa

Swenson, David A July 2013

Extreme weather events are a likely outcome of climate change

Iowa's climate is changing, and that means Iowa's economy is changing.

If climate change is “the mother of all externalities: larger, more complex, and more uncertain than any other environmental problem” (Tol 2009), there will be unarguable consequences for all aspects of economic activity in Iowa.

What did we look at in that 2011 study?

Agricultural Productivity and Food Costs

Contrasts abound

- Warmer, wetter, and more atmospheric CO₂ in the nearer term, should lead to higher yields ...

But

- More virulent weeds, pests, and pathogens are to be expected
- Increasing likelihood of extreme weather disrupting planting or otherwise interfering with crop progress

And

- If we become, unexpectedly, drier and warmer sooner than forecast, what would be those consequences?

The Insurance Industry Merited Its Own Subsection, as Well

Iowa has a national competitive advantage in marketing insurance products, and much of that competitive advantage is linked to property and casualty insurance.

In the face of weather extremes and our incremental adaption to those events, we would anticipate that ...

Iowa-based insurers will continually modify their risk evaluations as more scientific evidence is gathered.

This period of adjustment may create profitable opportunities for new and different insurance products, and it may also threaten profitability if firms are subjected to unanticipated liabilities or if they limit insurance coverage because uncertainty is so great that it precludes appropriate pricing.

It is important to remember that the insurance industry is the market-arbiter of tolerable risk, and its pricing structures will ultimately affect household, commercial, and agricultural activities.

Households

Incrementally warmer weather will give rise to ...

- More recreational and work activity
- Decreased *average* peril from snow, cold, and ice
- Incrementally alter household consumption

There are always offsets to consider ...

- Heat related stresses
- Respiratory and coronary diseases exacerbation
- More allergens and infections, and
- Physical injury associated with extreme events

Nonetheless

Extreme weather events affect households, commercial establishments, and governments directly:

- Private and public property damage
- Interferes with “business as usual”
- Imposes new insurance and other disaster / damage prevention costs
- May ultimately alter historical settlements and conventional land uses
- Will affect our overall quality of life

Widespread Government and Private Consequences: Recent Incidences

Serious flooding in 1993, 2008, 2010 & 2011 in Iowa resulted in

Extensive damage to water supply and waste treatment systems in Des Moines, Mason City, and Cedar Rapids and massive damage to state university property in both Iowa City and Ames.

Serious weather events have washed out roadways and bridges, and interfered with multimodal transportation systems.

Significant and prolonged disruptions of commerce

2008 Was an Especially Tough Year in Iowa

With just the floods of June, 2008, by mid-June, and using rudimentary extrapolations from very limited data, dire statewide economic outcomes were initially declared:

*The American Farm Bureau, as one example, announced there were **\$4 billion** in agricultural crop damages in Iowa alone (Conlon, 2008; Matton, 2008).*

*Another **\$4 billion** in commercial damages were estimated by state government officials by July, 2008, which when coupled with anticipated household losses put Iowa's presumed losses in the neighborhood of **\$10 billion** (Insurance Journal, 2008).*

There also were extraordinary institutional responses: for example, a separate state agency was created to deal with the administration of the recovery (Rebuild Iowa Office – RIO)

By September, 2008, the numbers were tempered – These are from the Rebuild Iowa Advisory Commission (RIAC)

September 2008 Weather-Related Loss Estimates

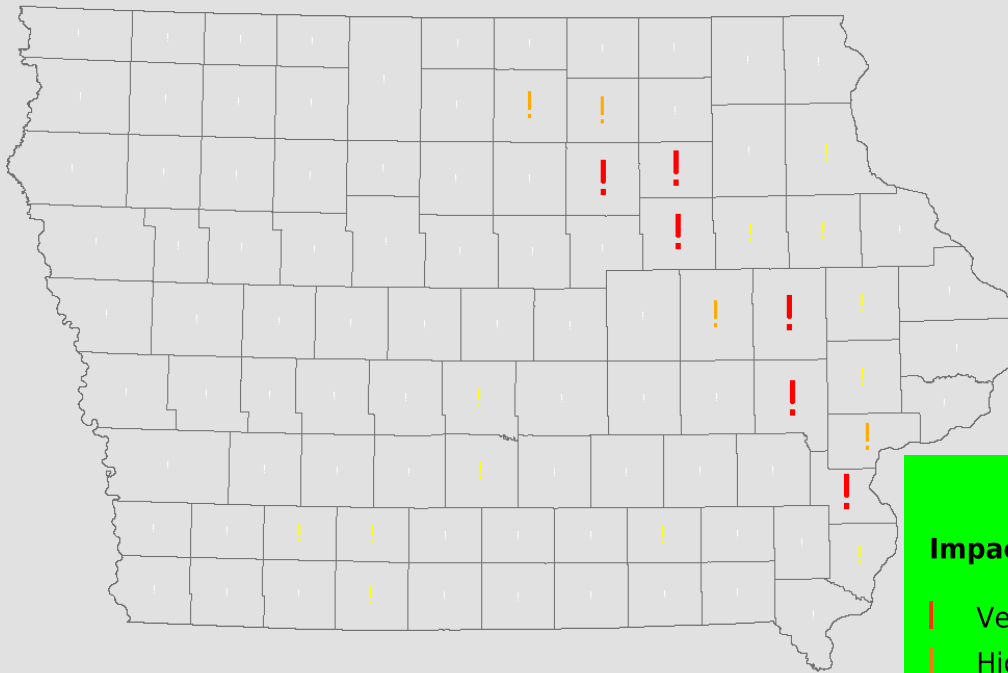
Category	Amount in Billions
Housing and business structures	\$1.326
Infrastructure	\$.660
Educational facilities	\$.2974
Cultural and historic landmarks	\$.2845
Agriculture and the environment	\$.9294
Total estimated losses	\$3.4983

Though everyone may have meant well, bad estimates abounded, and they stuck ...

- Farm Bureau farm impact numbers were way off
- State agencies compiled completely indefensible conclusions about commercial losses
- Cities imputed business losses into generalized reductions in regional productivity and started to manufacture job-loss multipliers out of thin air
- And politicians lumped it all together into a mush to use to justify federal and state aid and assistance and to remain in the forefront of legislative attention

Geography of Loss

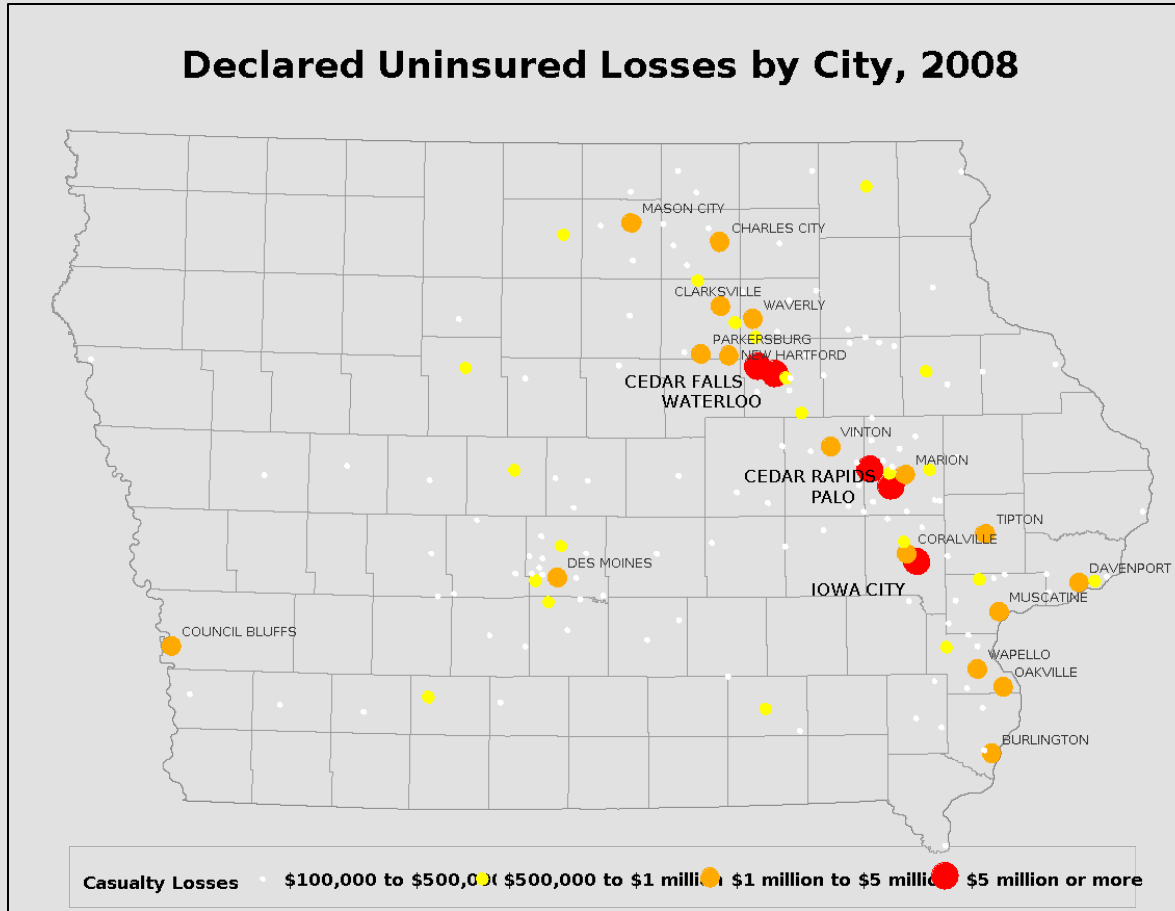
Weighted Loss Index for All Categories



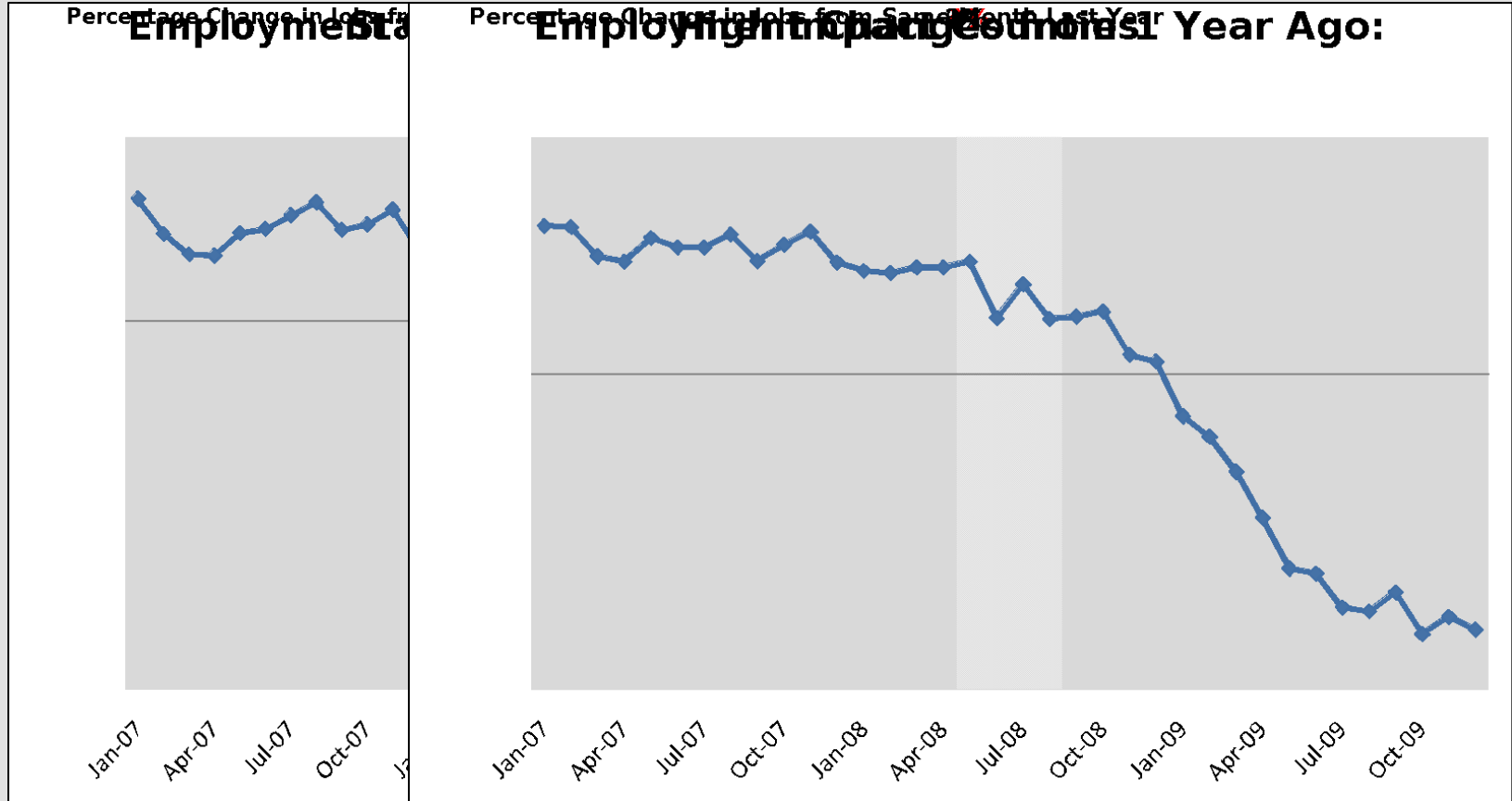
Impact Group	Number of Counties	Shares of Statewide Losses*		
		Household Losses	Public Sector Losses	Business Losses
Very High	6	77%	74%	93%
High	4	7%	5%	1%
Moderate	12	9%	9%	4%
Low	77	8%	11%	2%

* As documented by selected federal disaster assistance programs

Declared uninsured losses (from all sources)

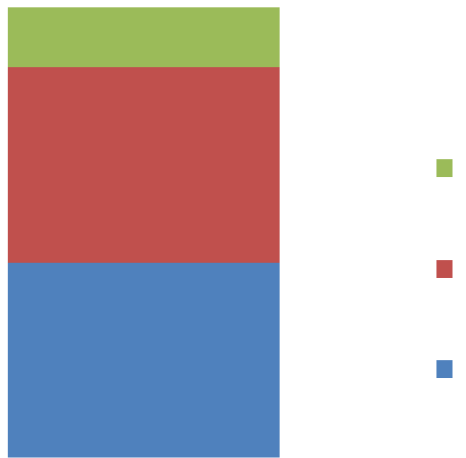


Impacts: Jobs

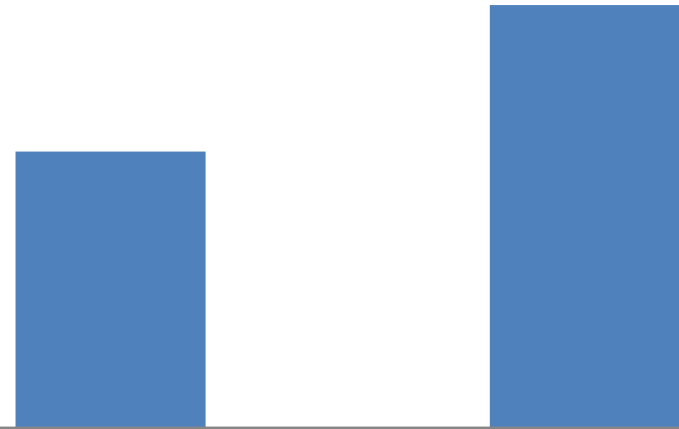


Oh, and those horrific ag impacts that were initially forecast?

Total Iowa 2008 Category Paymen



\$48,932,2008 Per Farm Net Income



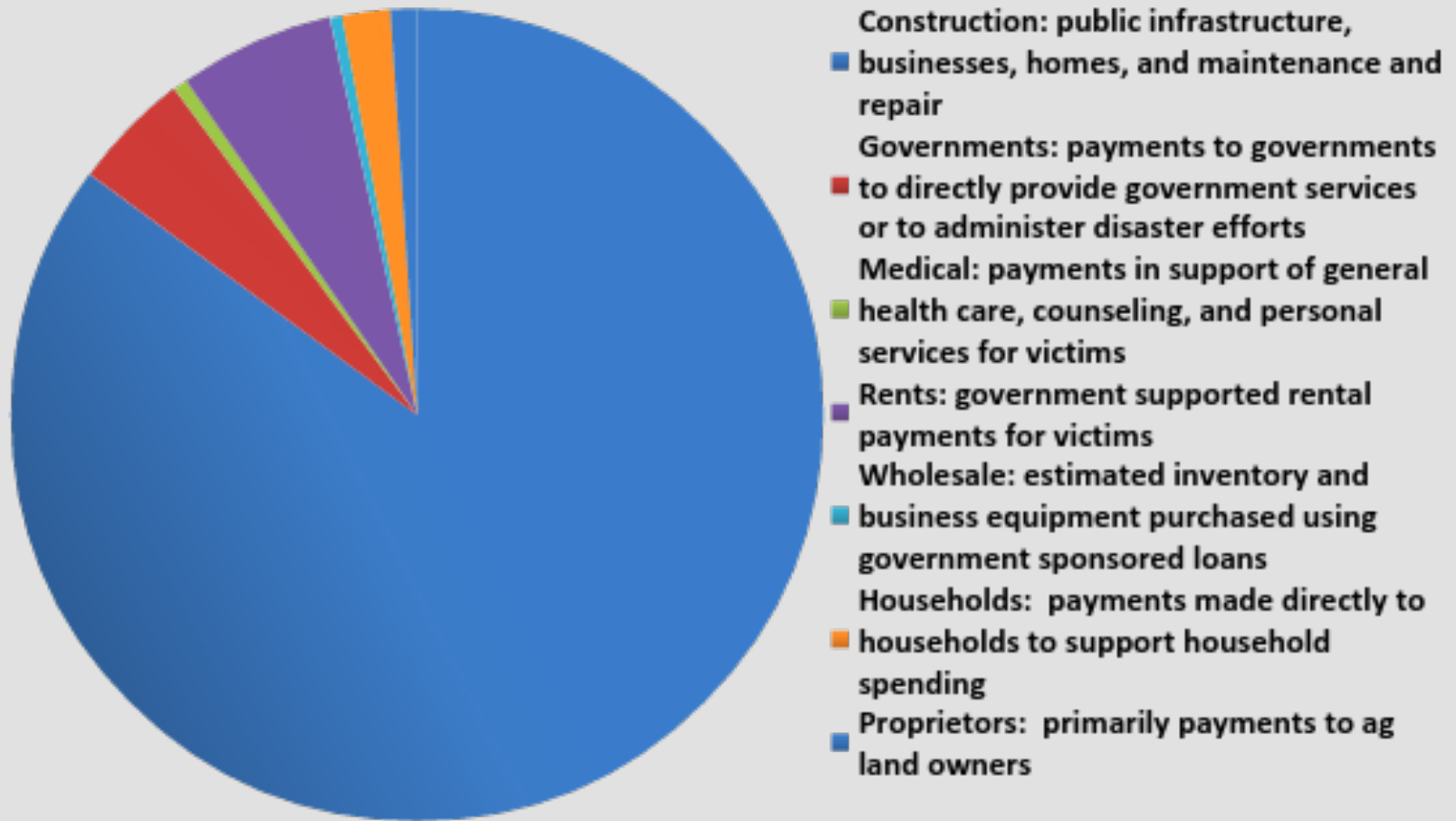
The costs: commitments of public assistance

Considering all sources of assistance, Iowa realized

\$3.346 billion in appropriations from all sources

Remember, in the first credible impact table, total initial losses were put at \$3.49 billion

Of the Initial \$2.43 Billion Actually Allocated at the Time of Our Report ...



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So, for the public sector

If, indeed “the dice have been loaded toward a higher probability of extreme [weather] events,” it could become increasingly important for Iowa to take broad and proactive measures to “enhance Iowa’s flood resistance (Takle 2010),” to protect its cities and to reduce future losses.

Local and state governments will increasingly require civil engineering innovations to deal with greater ranges of infrastructure-damaging occurrences, as well as withstand increased occurrence frequencies.

In response, governments will likely begin to implement more stringent design standards for critical infrastructure, to include hardening that infrastructure to withstand previously unthought-of occurrences.

All of these actions will increase taxpayer costs or shift costs away from other public service areas.

Because, as well all know, there is no free lunch.

Finally ...

A changing Iowa climate with increased weather volatility will create greater demands for disaster-response services. These services include monitoring disaster potentials, identifying vulnerabilities, and procuring governmental resources for recovery and humanitarian assistance, as well as disaster preparedness and training and disaster response and coordination.

If climate change yields greater consequences for households and communities [which our report predicted], those services will expand, and local and state government emergency services costs will necessarily increase to adequately fund the changes.

The big question is whether those costs will increase before the occurrences or after.

What are our challenges?

- Sharp erosion in local and state public service capacity
- Shifting federal funding emphases and definitions of what constitutes federal responsibility
- Dearth of engineering and other research to inform emerging preparedness
- Broad-based equivocation regarding the potential consequences of climate change or the occurrences of extreme weather on the nation's and our state's disaster preparedness responsibilities
- Crisis amnesia

Thank You

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