

Higher Standards for Increased Resiliency

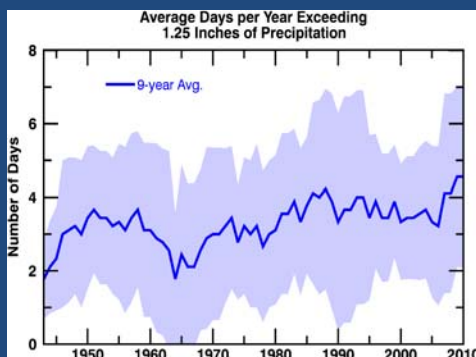
Keely Davidson-Bennett

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Increases in Extreme Precipitation Events Indicate That Resiliency Measures Will Be More Important in the Future



Cleveland

22% in amount falling in heaviest rain events
16% in number of heaviest rain events

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Third National Climate Assessment (2014) Forecasts

- Very heavy precipitation events predicted to increase nationwide
- Increases in frequency & intensity of precipitation expected in Midwest

D'Orgeville et al. (2014)

- Precipitation in 50 year storm in Great Lakes region expected to be 14-29% greater in 2045-2060 than 1979-1994

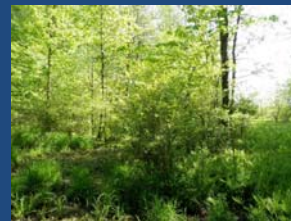
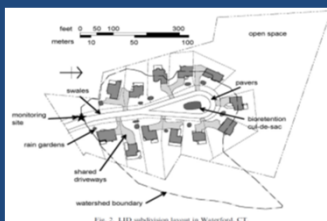
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Resiliency Measures

- Riparian & wetland setbacks
- Higher standards for flood damage reduction
- Increased use of green infrastructure
- Better stormwater management
- Better development practices



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In a Changing Climate, Are More Restrictive Regulations Needed for Resiliency?

- Wu et al. (2010) found future 100-year flood on Upper Great Miami in Dayton might increase by 10-20%

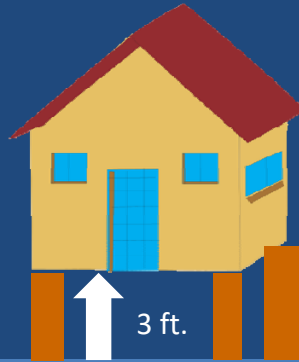


What are some examples of communities with higher standards than CRWP's model codes?



3 ft. Freeboard

- 42 communities/counties have 3 ft. freeboard in U.S.
- 7 of these are in Great Lakes States (IL & NY)



Cedar Falls, Iowa

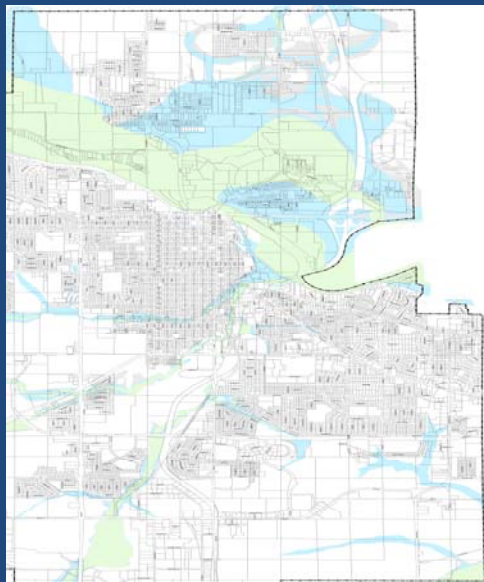
- Uses 500-year flood elevation as regulatory elevation
- New construction/substantially damaged structures must be 1 foot above 500-year flood elevation
- No new lots allowed in 500-year floodplain unless they have buildable area outside 500-year floodplain
- Critical facilities must be outside 500-year floodplain



Cedar Falls, Iowa Floodplain Map

Legend

	100 Year Floodplain District
	500 Year Floodplain District
	Floodway District



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Cedar Falls, Iowa



- 2008 floods were motivation for new standards



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Cedar Falls, Iowa

- Bought out 300 homes using federal & state funds



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Chapel Hill, NC

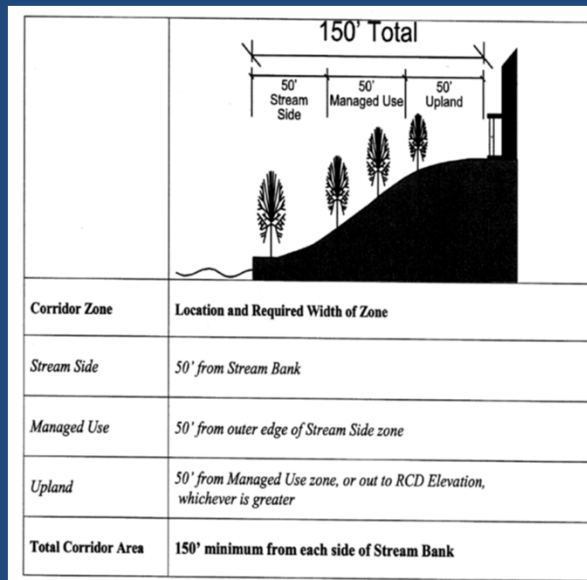
- Overlay district that encompasses the larger of the 100-year floodplain elevation + 3 feet (RCD elevation) or 150 feet from streams. Any structures in these mapped areas must have their lowest floor elevation at least 18 inches above the RCD elevation.

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Chapel Hill, NC



Chapel Hill, NC

Use	Stream Side Zone	Managed Use Zone	Upland Zone
Streets, bridges, and other similar transportation facilities where there is a practical necessity to their location within the Resource Conservation District	S	S	S
Sidewalks	P	P	P
Accessory land-disturbing activities ordinarily associated with a single-family or two-family dwelling, such as fences, gardens, and similar uses	N	P	P
Driveways and utility service lines when there is a practical necessity	P	P	P
Public maintenance of streets, bridges, other similar transportation facilities and/or public utility and storm drainage	P	P	P

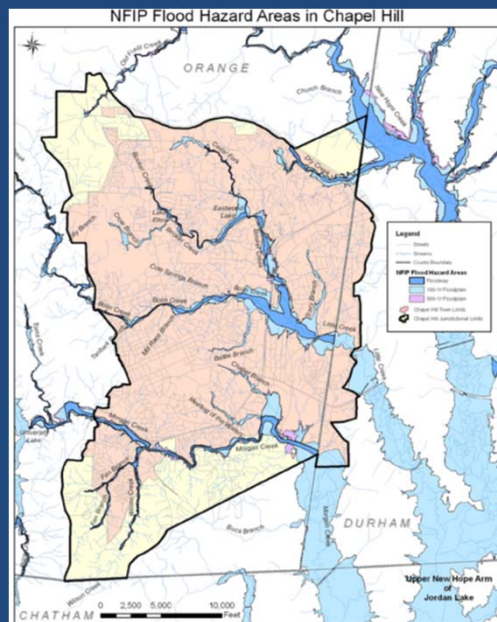
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Overlay district zoning encourages:

- Development as far to edge of RCD as possible
- Cluster development
- Shared driveways & other strategies to minimize impervious surfaces



Chapel Hill, NC



Federal Flood Risk Management Standard (FFRMS)

- Applies to federal buildings & projects
- Avoid building in floodplain when practicable
- Elevate or floodproof to ≥ 2 ft. above BFE (3 ft. for critical infrastructure) OR build at 500-year elevation
- Use higher elevations to evaluate floodplain width
- May also use future flooding info where available (coastal areas)



Potential Community Application of FFRMS Recommendations

- Consider requiring elevation to 500-year elevation when that's higher than 2 ft. above BFE
- Use future flooding info as it becomes available



Questions? Discussion?

- Any other examples of communities with higher standards than CRWP recommendations?



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