*Research Summary*

# Do Planners Matter? Examining Factors Driving Incorporation of Land Use Approaches into Hazard Mitigation Plans


## Authors

**Ward Lyles**
(wlyles@unc.edu) is a Post-Doctoral Research Associate at the Institute for the Environment at the University of North Carolina at Chapel Hill.

**Philip Berke**
(pberke@unc.edu) is a Professor in the Department of City and Regional Planning at University of North Carolina at Chapel Hill and the Deputy Director of the Institute for the Environment.

**Gavin Smith**
(gavin_smith@unc.edu) is an Associate Research Professor in the Department of City and Regional Planning and the Executive Director of the Department of Homeland Security's Coastal Hazards Center at the University of North Carolina at Chapel Hill.


Economic losses due to natural hazard events have been growing dramatically for decades and climate change exacerbates existing threats. A major federal policy response to the trends of rising losses was the Disaster Mitigation Act of 2000 (DMA), which requires all local governments to adopt hazard mitigation plans to remain eligible for certain federal disaster funds. Communities can use hazard mitigation plans to organize a comprehensive set of policies and actions to reduce long-term risks from natural hazards. National consensus studies hold that land use policies, such as zoning, offer the greatest long-term risk reduction potential because they can steer development out of hazardous locations. Repeatedly, studies have shown that land use approaches to mitigation are underutilized. Hazard mitigation planning is typically the responsibility of emergency managers, whose training, expertise and responsibilities often do not relate to long–term land use development. Thus, there is a potential expertise gap for integrating land use policies into hazard mitigation efforts if local planners are not involved.

## Research Questions

(1) Does inclusion of local planners on hazard mitigation planning committees lead to the incorporation of more land use approaches in hazard mitigation plans?
(2) Do the state planning policy context, planning process features, and local community characteristics found to influence the quality of hazard mitigation planning in comprehensive plans (i.e. hazard mitigation planning done before passage of the DMA) also influence the incorporation of land use approaches in hazard mitigation plans?

## Methodology

A random sample of plans for 175 local jurisdictions in six states was content analyzed. The sampling of the jurisdictions represents diverse state planning policy contexts and has wide variation in local characteristics. The content analysis data was used to determine if 16 land use policies applicable to hazard mitigation are incorporated into hazard mitigation plans. We measured their incorporation into three mitigation plan components: 1) assessment of existing land use policies in its *fact base*, 2) proposal of new or modified land use *policies*, and 3) inclusion of *implementation* information (i.e. a responsible agency, timeline and projected cost) for the proposed policies. Multivariate regression models were used to examine the influence of local planner involvement on the incorporation of land use policies into the three components of hazard mitigation plans, controlling for state and local factors. Diagnostic tests of model assumptions were performed.

## Relationships between Independent Variables and Incorporation of Land Use in Mitigation Plans

The table below shows the results of three regression models with *Positive* denoting positive relationship, *Negative* denoting negative relationship and --- denoting no statistically significant relationship detected. Interpretation is provided on the following page.

| Incorporation of land use<br><br>Independent Variables | **Assessment of Existing Policies in Fact Base**<br><br>Measured as an index score for assessment of 16 land use policies. | **Proposal of New Policies or Modifications to Existing Policies**<br><br>Measured as a count of number of 16 land use policies proposed for future implementation) | **Inclusion of Implementation Information for Proposed Policies**<br><br>Measured as a count of the number of items of implementation information - i.e. responsible agency, timeline and cost - for the land use policies proposed in the plan |
|---|---|---|---|
| Jurisdiction's Own Planner Involved on Planning Committee [#] | --- | Positive | Positive |
| Other Jurisdictions' Planner Involved on Planning Committee [#] | --- | --- | --- |
| Overall Diversity of Groups on Planning Committee | --- | Negative | Negative |
| State Planning Mandate (with Hazards Element) [##] | Positive | --- | Positive |
| State Planning Mandate (without Hazards Element) [##] | Positive | --- | Positive |
| Population Density of Jurisdiction | --- | Negative | --- |
| Population Growth of Jurisdiction | --- | --- | Negative |
| Community Wealth of Jurisdiction | --- | --- | --- |
| Previous Disaster Experience | Negative | Negative | Negative |

***Notes on Regression Models:*** [#] Jurisdiction's own planner and other jurisdiction planner are in comparison to involvement of no planner. [##] State mandate variables are in comparison to no mandate. For the Fact Base variable, an Ordinary Least Squares model was used, while Poisson models were used for the Policies and Implementation variables. In the Implementation model, the number of Land Use Policies was used as a control variable (not shown) and had a positive relationship. Sample size was 175 jurisdictions for all three models.

| Independent Variables | Measurement |
|---|---|
| Local Planner | Three-level categorical measure of planner involvement on planning committee: jurisdiction's own planner involved; planner from other participating jurisdiction; no planner involved |
| Overall Diversity of Groups | Number of 22 different categories of stakeholder groups represented on planning committee |
| State Planning Mandate | Three-level categories measure of whether the state requires local comprehensive plans for local jurisdictions: mandate with a hazards element required; mandate without a hazards element requirement; no mandate |
| Population Density | The number of persons per square mile of land area |
| Population Growth | The percent change in population in the 10 years prior to the date of plan adoption |
| Community Wealth | Median value of owner-occupied homes in dollars |
| Previous Disaster Experience | Number of Presidentially Declared disasters in the 10 years prior to the date of plan adoption |

## Key Findings

***Incorporation of land use is low overall:*** In the multi-state sample used in this study, scores for incorporation of land use into mitigation plan fact bases, policies, and implementation are very low. Other types of mitigation actions (e.g. education programs, emergency services actions, and retrofitting existing buildings) are more common.

***Jurisdictions propose more land use policies when their own planners are involved:*** Jurisdictions propose more land use policies in mitigation plans and include more implementation information for those policies when their own planner is on the mitigation planning committee. In contrast, involvement of another jurisdiction's planner is not clearly related to inclusion of more land use policies or implementation. Including local planners with place-based knowledge about the practical and political feasibility of potential land use policies appears to be critical.

***Use of land use policies is not higher in mandate states:*** There is no relationship between state mandates for comprehensive planning and inclusion of more land use policies in mitigation plans. Four of the six states in our sample (FL, NC, CA, WA) have enacted mandates and two states (GA and TX) have not. On the other hand, state mandates for local comprehensive planning are positively related to more detailed assessment of land use policies in the fact base and inclusion of more implementation information.

**Prior disaster experience does not increase attention to land use policies.** As jurisdictions experience more major disasters they assess fewer existing land use policies, propose fewer land use policies, and include less information for proposed land use policies. Repeated cycles of short-term recovery may reduce attention to long-term adjustments to development patterns.

## Implications for Practice

Based on these findings, the following recommendations are offered:

- **Federal and state mitigation officials need to be more proactive in building local capacity and commitment.** Efforts to implement FEMA's new 'Whole Communities' initiative (http://www.fema.gov/whole-community) need to pay particular attention to involving local planners in mitigation stakeholder networks.

- **Local emergency managers should increase efforts to involve local planners for all participating jurisdictions.** Local planners should in turn reciprocate through active participation.

- **Mitigation officials at all levels need to be highly cognizant of the state policies and local community characteristics that increase inclusion of land use policies in mitigation plans**. Federal and state officials need to assess existing state mandate for comprehensive planning and locally constraining conditions, such as repeated major disasters, and target efforts to build local commitment and capacity accordingly.

- **FEMA should require jurisdictions to explicitly identify how they are using land use policies to reduce hazard risks now and how they plan to do so more effectively in the future.** FEMA's guidance for local mitigation plans need to be explicit in requiring assessment of existing land use policies for reducing hazards risks, identifying gaps in the policies, and including adjustments to land use policies that can fill in the gaps in mitigation plans.

## Additional Information

The full version of this publication and research summaries for other publications are available at: http://hazardscenter.unc.edu/mitigation-planning/ and at http://www.ie.unc.edu/cscd/projects/dma.cfm.

More about the Coastal Hazards Center and its work can be found at http://hazardscenter.unc.edu. More about the Institute for the Environment and its work can be found at www.ie.unc.edu.


## Acknowledgements

This material is based upon work supported by Royster and PERISHIP fellowships and the U.S. Department of Homeland Security Coastal Hazards Center under Award No. 00313690. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, express or implied, of the U.S. Department of Homeland Security.