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MEASURING THE ADOPTION OF DEVELOPMENT MANAGEMENT POLICIES AS AN INSTRUMENT OF DISASTER MITIGATION TOWARD RESILIENT COASTAL COMMUNITIES IN FLORIDA

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by
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MEASURING THE ADOPTION OF DEVELOPMENT MANAGEMENT POLICIES AS AN INSTRUMENT OF DISASTER MITIGATION TOWARD RESILIENCE COASTAL COMMUNITY IN FLORIDA

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Coastal hazards have been known as the scariest group of hazards, monsters that threaten 39% of the nation population and in less than 10 years. With the current population growth, the monsters will harm almost half of the nation's population (45% to be exact) and uncountable properties placed at only 17% of land area of the country. The threat of coastal hazards has never been low, but it keeps rising because no human being in this world can prevent, stop, contain or avoid the hazards from happening. But, there always are ways to lower the risk and the loss with an effort called mitigation.

The mitigation effort has been done through many ways, and one of the most popular ways is by incorporating it into comprehensive planning both at the state and local levels. Local level comprehensive planning has been seen as more directly impacting policies, because the community becomes more directly involved during the process of envisioning their future. While this research focuses on coastal areas and coastal hazards, coastal management is another concern and considerably involved in supporting the disaster mitigation effort. Hazard mitigation, coastal management, and the local comprehensive plan are three crosscutting efforts and joined forces that can be need to create a more resilience coastal community.

In an effort to measure how the three crosscutting tools have been adopted in managing the development in vulnerable coastal areas, a matrix was developed to empirically examine 35 local comprehensive plans of the coastal counties in the second largest U.S. coastal state, Florida, to see if sets of development management policies have been regulated in the coastal management element of comprehensive plan documents.

The findings of this research show that the moderate total score percentage of most jurisdictions (30 counties) policies adoption, ranged from 26%-75% and 60% of the total jurisdictions (20 counties) adopted 50%-74% of the overall policies which indicate that in general, most jurisdictions have paid moderate attentions in integrating hazard mitigation, coastal management and comprehensive plan. Among 18 sub-policies measured in the coastal management element of the comprehensive plan studied in this research, sensitive land protection, relocation effort and siting public facilities at hazard free areas appear to be the most adopted policies by the jurisdictions, with an adoption rate more than 50%. Even though only 6 policies out of 18 sub-policies got attention less that 50% in the coastal management element. Especially the elements like hazard disclosure and warning signage at the hazardous areas need to be considered and added in the element because of their critical functions for hazard mitigation efforts. The result of this research is not the only way to measure the adoption of development management strategies by coastal counties. There are many other documents like coastal management plan and program, emergency plan, and hazard mitigation plan those also incorporate development management strategies. This research specifically evaluates development management strategy adoption in coastal management element of the local comprehensive plans.

DEDICATION

To:

ىلاعت و هناحبس الله

My Father (Alm. Anwar Syamaun) in Heaven
My Mom (Ruaida Abdul Majid)
My Brothers (Alfin Khairi and Arif Hidayat)

&

The Government of Aceh, Indonesia

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Table of Content

List of Tables

List of Figures

CHAPTER 1: INTRODUCTION

1.1 Background

United States coastal area vulnerability to natural hazards has been at the focus of national discourse in recent years. Even though natural hazards have occurred almost every single year throughout history, their appearances recently have been showing a rapid increase of devastating impact. Hundreds of million of dollars have been spent annually, and the federal spending for hazards coverage has been unsustainably increasing every year (NOAA, 1998). One of the leading factors contributing to the increasing in disaster losses is the constant rise of the population living in high-risk areas including coastal areas.

Americans and the world will never forget the devastating Hurricane Sandy that struck Atlantic Coast in October 2012. According to The National Weather Service, and National Oceanic and Atmospheric Administration (2012), the coastal hazard, Sandy, had caused 72 direct deaths, 87 indirect deaths, and damaged or destroyed about 650,000 houses with the total loss over $50 billion. This is an extreme loss from a single event that doubled the total loss of all the hazards that occurred in Natural Catastrophe Year of 2011 that reached $23.9 billion. Besides the hazard striking in the US region with the highest population density, another reason why this extreme loss number occurred is due to the region's great GDP contribution to the country. The impact of disasters on an economy will depend on many factors like the nature of the shock, the size and structure of the economy, population concentration,

per capita income, financial depth, governance, and openness (Laframboise and Loko, 2012). These facts call into question the resilience of our built environment to natural hazards, and reinforce the importance of hazard mitigation.

Having half of its coastline facing the Atlantic Ocean, Florida has never been less at risk of coastal storms and hurricanes. Walking 10 years back through the time, Florida has been documented to experience several catastrophic hurricanes including Charley (August 2004), following 3 weeks after that, Hurricane France (August 2004), Jeanne and Ivan (September 2004), Wilma (October 2005) and Tropical Storm Fay (August 2008) all of these hazards had caused direct and indirect fatalities and hundreds of millions of dollars loss (Orlando Sentinel, 2014). Besides hurricanes, floods and coastal erosion are also major threats to coastal communities, putting more and more people at risk.

Learning from those catastrophic events in coastal areas, Florida, as the second largest coastal state and one of the busiest coasts in the United States since it is exposed to many coastal hazards, has developed a comprehensive effort for hazards mitigation. But as beaches are very pivotal in Florida for its people and tourists, increasing population and real estate market demand for properties are hard to avoid and have placed Florida as one of the most vulnerable states (Bush, 2004; The World Bank, 2013)

According to The Federal Emergency Management Agency (FEMA), hazard mitigation is "*Sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects*" (Introduction to Hazard Mitigation, 2006). One of the approaches to reach goals of hazard mitigation is requiring coordination among local, state and tribal government. This requirement was established and passed by the U.S. Congress as the Disaster Mitigation Act (DMA) in 2000 (Disaster Mitigation Act of 2000). Therefore, since Florida coastal areas are exposed to many natural hazards, coastal hazard mitigation and management should be enforced at all levels, especially at the local level.

Aware that more than half of its population is under the threat of coastal hazards, the state of Florida mandated coastal management as one of the required elements in local comprehensive plans. The coastal management element itself has hazards mitigation and risk reduction to achieve the dual goals of conserving coastal resources and maintaining nature's hazard protection systems. The integration of Coastal Zone Management (CZM) is now part of international conventions and agreements as well as framing and directing attention to the local level (Allmendinger et. all, 2002). One of the important aims of CZM is to integrate the knowledge of coastal hazards and risks into development standards and planning guidelines (Clark, 1994).

That planning is very essential in the effort of disaster mitigation, has been demonstrated by research conducted by Burby and Dalton (1994), where it was shown that the more an area experiences repeated hazards, the more likely it will

adopt plans. Catastrophic loss and development pressure have become the indications of hazards seriousness. Therefore, development management has been seen as a valuable potential tool in managing the use of land in protecting new and future development from hazards (Buby & Dalton, 1994). Today, local jurisdictions have used many techniques to enhance community resilience. But the traditional ways such development management is still practiced by guiding construction away from hazardous area, limiting the density and reducing the exposure of the community in high-risk areas (Olshansky & Kartez1998; Burby et al., 2000; FEMA, 2013).

This research will observe and evaluate the adoption of development management as an instrument of hazard mitigation in selected coastal counties' comprehensive plans where coastal management is a required element.

1.2 Problem Statement

Many hazard researchers believed and identified in their research that land use planning is a pivotal activity for reducing natural hazard-related loses (Berke 1998; Burby et al. 1999; Mileti 1999; Burby 2005; Stevens 2010). Burby et al. (1999) and Stevens (2010) added that the coalition of local government and land use planning could be most effective in reducing losses. The regulatory powers of local government can guide new development away from hazards-vulnerable areas by directing new development to less hazardous areas and/or by requiring the use of mitigation design and techniques that can minimize the hazard risk. This is the basic

reason why this research is examining comprehensive plans at the local level, where coastal management is one of the required elements.

Hazard mitigation is not a single independent action that can work by itself to reduce the risk of hazards. Hazard mitigation, as mentioned in the background of this research, needs to be incorporated in local plans. The comprehensive plans rely on a mix of mitigation strategies that fall into four principal categories (Berke, Smith & Paleo, 2009): 1) Public information (for example hazard disclosure, mapping of hazards, education and outreach initiative), 2) structural property protection (for example building and infrastructure hardening, elevation of flood-prone property, levees, seawall), 3) Natural resource protection (for example beach, dune, and wetlands preservation, riparian buffers), and 4) hazard avoidance (for example limiting future development in hazard zones, relocating existing development from hazard zones).

The powers of local government that can be used to address natural hazard risk are summarized by Stevens (2010) into five powers:

1. Planning power: Gaining community agreement on a land use plan to manage natural hazards, local government can inform, educate, persuade, coordinate, encourage participation and consensus, and offer a vision of the future;
2. Regulatory power: Directing and managing community development to achieve desirable land use patterns and mitigate natural hazards toward a more resilience community, local governments can use the tools of zoning, subdivision regulation,

building codes, sanitation codes, design standards, urban growth boundaries, wetland and floodplain regulations an so on;

3. Spending power: Controlling public expenditures to achieve community objectives such as existence of infrastructure provision with growth or restricting provision of infrastructure within hazard areas, local government can also use their capital improvement programs and budget;

4. Taxing power: Supporting community programs such as infrastructure building and hazard mitigation. Some tools, for instance special taxing districts and preferential assessment for agriculture and open space uses, can be used by the local government;

5. Acquisition power: Gaining public control over hazardous areas, local governments can purchase development rights and can accept dedication of conservation easements.

Based on theory, in the context of hazard mitigation and coastal management, the local jurisdiction's power associated or collaborated with the mitigation strategies will result in effective efforts in reducing the coastal hazard-related losses. Currently, most local hazard mitigation plans are included in the local government's comprehensive plan. Some evaluations of disaster management content also have been conducted at the state level (Berke et all., 2009) and also local level (Lewis, 2011, Berke et all., 2012 a). Even though much research related to comprehensive plan evaluation has been conducted to evaluate the hazards element, none of the research has a precise evaluation of how the development management policies have

been adopted in local comprehensive plans those that have coastal management element as a requirement. Most of previous research conducted is based on overall evaluation of hazard mitigation strategies and as a result, the findings of the research are not detailed. Therefore, more research of specific elements in local level comprehensive plans is needed in the future.

In recognition of this gap in the current research, this study proposes a proactive model to empirically examine some specific contents of Florida local comprehensive plans, specifically the extent to which development management policies have been adopted as an instrument of disaster mitigation efforts.

1.3 Project Overview

This study explores the extent of hazard mitigation as a component in the coastal zone management (CZM) elements of local the comprehensive plans. The research examines the important literature related to the hazard mitigation process and how it can be integrated in the coastal zone management (CZM) element in local comprehensive plans to develop more resilient coastal communities. This challenge of integrating coastal zone management in local comprehensive planning led to following research questions:

1) To what extent have local comprehensive plans adopted the development management as an instrument of hazard mitigation in the coastal management element?

2) Do the local comprehensive plans have all the development management policies in the coastal management element?
3) Which policies appear to be the most adopted development management policies in the local comprehensive plans?

These questions are answered by reviewing local comprehensive plans in 35 coastal counties in the second largest coastal state, Florida. For this research, only local comprehensive plan that are available online are being evaluated, with further search limitation in the key word "comprehensive plan". So, any document other than the comprehensive plan will not be included in this content evaluation process.

The research findings include the scoring of each plan, as well as the identification of specific development management policies or strategies that currently being used in coastal management element in local comprehensive plans. This research has helped to establish some recommendations that can be used by planners in the future to include more comprehensive and integrated hazard mitigation in local comprehensive plans.

Chapter 2: Literature Review

2.1 Coastal; Facts and Problems

A coastal area is a very unique area because of its delineation. Not like other inland areas that can be easily bordered administratively, a coastal area is an exception. It is influenced by the interface of activities both on land and in the ocean. Commonly called a coastal zone, this area has been given many definitions. As unique as it is, there is no consensus definition of a coastal zone. The Institute for Sustainable Development and International Relation [IDDR] (2010) on its presentation at the 2nd Ad Hoc Legal and Technical Working Group Meeting on the integrated Coastal Zone Management (ICZM) in Kenya has mentioned some definitions of coastal zones worldwide. Table 1 includes several of these coastal zone definitions.

Table 1. Coastal Zone Definitions

Country/ Institution	Definition of Coastal Zone
US Coastal Zone Management Act, 1972	The coastal water (including the land therein and thereunder) and the adjacent shorelines (including the water therein and thereunder) strongly influence by each and in proximity to the shorelines of the several coastal states and include islands, transitional and intertidal areas, marshes, wetlands and beaches.
South Africa's Integrated Coastal Management Act, 2008	The area comprising coastal public property, the coastal protection zone, coastal access land and coastal protected areas, the seashore, coastal water and the exclusive economic zone and include any aspect of the environment on, in, under, above such area.
World Bank, 1996	The interface where the land meets the ocean, encompassing shoreline environments as well as adjacent coastal waters. Its components can include river delta, coastal plains, wetlands, beaches and dunes, reefs, mangrove forests, lagoons, other coastal features.
Mediterranean ICZM Protocol, 2008	The geomorphologic area either side of the seashore, in which the interaction between marine and land parts occur in the form of a complex ecological and resource system made up of biotic and abiotic components coexisting and interacting with human communities and relevant socio-economics activities.
General Trend: Flexibility, UNESCO/ IOC, 1997	Its precise delimitation depends directly on the problem posed initially. The limit should therefore expand into the sea and land just as far as required by the objectives of the management plan.

Based on these definitions of a coastal zone, some keywords, for instance “interface of land and seashore”, “environmental ecosystem”, and “human activities” have become focal points of the definition.

Coastal zone environments and ecosystems have been known as having critical functions that are very important to both land and sea. Coastal zones have been a home for highly diverse ecosystem where many species obtain their food and build their life. It is also a very attractive area for many economic activities. According to Bijlsma, et al. (2014), the attraction of coastal zones has generated increasing population growth and economic development. This condition has led the coastal zone in many places to experience problems like decreasing community resilience, natural incapability to adapt, and increasing vulnerability to hazards.

Many natural hazards have been identified as striking coastal zone areas. Some are mild and some are sadly devastating. In the United States, coastal area is very vulnerable to various natural hazards, including storms, flooding, coastal erosion, tsunamis and land subsidence (NOAA, 2013). The risk of these hazards is getting worse due to the increasing population in coastal areas, although coastal counties are only 17 percent of the U.S land area. In 2010, coastal areas had more than 123 million people, equal to 39 percent of the nation’s population (U.S Census Bureau, 2011). With the current growth rate, in 2020, U.S coastal counties are estimated to have about 143 million people which means nearly 45% of the population of the whole nation will reside in areas covered not even one-fifth of the nation’s land area

(Consortium for Coastal Leadership, 2013). Therefore, it is a very challenging task for the government to manage the coastal zone.

In line with the growing population, the number of losses caused by natural hazards in the U.S. has been unsustainably increasing, as well. Their appearances recently have been showing increasingly devastating impact. According to NOAA (1998), estimated disaster losses in the United States ranged from $10 billion to $50 billion annually, with an average loss of a single major disaster around $500 million. Coastal hazard has been one of the contributors to those losses. Reported from year 1990 to year 2008, coastal hazard by itself (does not include flooding, storms, earthquake and tsunami) contributed a total of 3.3 billion dollars to the total losses caused by natural hazards in the nation (Hazards and Vulnerability Research Institute [HVRI], 2013).

The World Bank in 2013 announced 10 cities worldwide with the highest risk to flooding in terms of total cost of damage. In the first place is Guangzhou, followed by Miami, New York and New Orleans. Surprisingly, these four top cities alone contributed 43% of the possible total global loss. Among five US cities that are listed as top 10 most vulnerable cities in the world, two of them are Miami (2nd place) and Tampa (7^{th} place), which are first and second most populous metro areas in Florida (Florida State Official Website, 2014). Besides the treat of flooding, Florida also ranked as the most state exposed to hurricanes. Based on research by Camara in 2013, Florida's exposure to hurricanes in total is $2.46 trillion. This large exposure itself almost doubled the combination of several other state's exposures, including Virginia,

North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana and Texas ($1.83 trillion in total). In addition, another interesting fact from the research is that Florida's land area only covers 1.5% of the lower 48 states but unfortunately has been struck by seven of the ten most devastating hurricanes in US history. Therefore, hazards have been a fact of life for most people in Florida.

The entire state of Florida State has been known as a coastal zone, but there is interesting way that the state defines its coastal zone boundary. According to NOAA (2012 a), the definition of a Florida coastal zone is (as written)

> Florida's coastal zone is the entire State, but has two tiers. Local governments eligible to receive coastal management funds are limited to those Gulf and Atlantic coastal cities and counties, which include or are contiguous to state water bodies where marine species of vegetation constitute the dominant plant community. Florida's seaward boundary in the Gulf of Mexico is 3 marine leagues (9 nautical miles) and is 3 nautical miles in the Atlantic

With the entire state is defined as a coastal zone, many people are at risk and are exposed to the coastal hazard, especially in the coastal counties. Even though the entire state is considered as a coastal zone, in Florida there are 35 counties listed as coastal counties. These counties are selected based on their direct border to the shoreline. In year 2010, the total population of Florida was 18, 801,301 people (Census Bureau, 2010). Among the total of Florida's population, coastal counties contributed three-fourths or 75% equal to 14,194, 603 people (FDEP, 2012).

Having three quarters of its population living in coastal counties, none of the Florida's counties' population is 100% free of coastal hazard risk. A scenario of

people at risk for coastal hazard conducted by Florida Department of Environmental Protection in 2012 showed that among 35 coastal counties in Florida, the county with the least at-risk population still has 12% of the total population in the county at risk. More than half of the counties, 18 counties, have 35% or more people at risk and one of them even has 99% of its people at risk. Figure 1 is the map of At-Risk Population in Coastal Counties as a percent of total population.

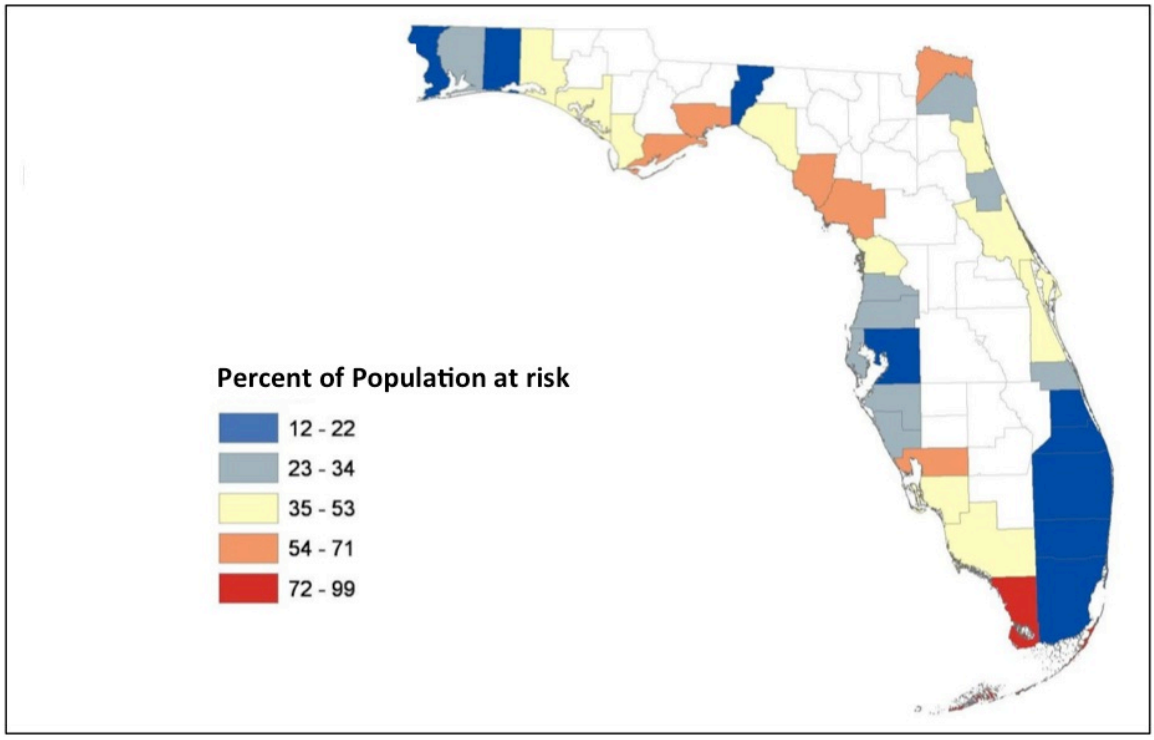

Figure 1. At-Risk Populations in Florida Coastal Counties as a Percent of Total Population in 2010 (*Adopted from FDEP, 2012*)

In conclusion, the fact that coastal areas are economically attractive and home for 39% of the nation's population has put many lives at risk of the coastal hazards, including those who reside in Florida.

2.2 Hazard Mitigation: Importance and Challenge

Hazards have sadly brought harm and fatalities to many people and properties for years. Even though natural hazards have occurred almost every single year throughout history, their appearances recently have been showing rapid increases of devastating impacts. These facts call into question the resilience of our built environment to natural hazards. No one can stop, avoid, contain or prevent hazards from occurring, but there is a way to save lives and protect property (Winsner, 2004). This is the basic reason why many experts and country leaders worldwide have called hazard mitigation into their national and world concerns.

According to Federal Emergency Management Agency (FEMA), hazard mitigation is "Sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects" (Introduction to Hazard Mitigation, 2006). One of the approaches to reach goals of hazard mitigation is by requiring coordination among local, state and tribal governments. This requirement was established and passed by the US Congress as the Disaster Mitigation Act (DMA) in 2000 (Disaster Mitigation Act of 2000). Therefore, since our coastal areas are exposed to many natural hazards, coastal hazard mitigation and management should be enforced at all levels, especially at the local level of government.

The hazard mitigation effort, besides its power to reduce the risk of hazards to people, property and minimize the spending to recover from a disaster, also helps communities to be more sustainable and resilient by focusing on some assessment and

analysis to identify actions that should be taken in the vulnerable area. According to FEMA (2012) there are four core steps in completing a mitigation plan.

Figure 2. Four Core Steps in Mitigation Plan (*Adopted from FEMA, 2012*)

The **first** step, organize resources, is aimed at getting the community to focus and find resources that potentially will be needed during the process of mitigation; for example, what interests the community has on the disaster mitigation and what skills or expertise that might be use during the process. **Secondly**, assess risk, is identification of how potential hazards can harm the community including information on who will be affected and the estimated potential losses especially to those assets considered as important to the community. The **third** step, develop a mitigation plan, is the action of finding the best possibilities to reduce the risk and unwanted impacts and setting the community priorities. The result of the third step will be a hazard mitigation plan and list of implementation strategies. And the **last step**, implement and monitor progress, in short is an action to make the strategy and

policies keep going in day-to-day life. Make sure everything is effectively implemented, with some adjustments and revisions, if necessary, as an effort to stay focused on the final goal that is a resilient community (FEMA, 2001).

Besides it being important, the implementation of disaster mitigation has never been easy. There are many challenges in implementing disaster mitigation, especially in incorporating it with plans. One of the challenges is when one policy is overlapping with the goals of disaster mitigation. For instance, when the plan tries to limit a new development in high-risk area, some policies like flood insurance and the increasing of disaster relief fund have caused the government to support the further development rather than limiting it. Burby and Dalton (1994) mentioned that the government had a more “growth-inducing” policy than a ”growth-reducing” hazard mitigation and this is what leads the development in vulnerable areas to keep growing.

One of the greatest challenges in hazard mitigation is triggering awareness and managing action taken toward hazard mitigation by the community. In increasing awareness and taking actions, all stakeholders at the community level need to have a mutual understanding about hazard risk (Smith & Berke, 2013; Mileti, 1999). In addition to that, they need to understand the relation between state and local government in terms of commitment to the implementation of hazard mitigation. According to Smith, G., Lyles & Berke, 2013, the state authorities experienced a hard time with the local authorities relative to their commitment to implementing hazard

mitigation. The local community's unwillingness to use the result of risk assessment in the hazard mitigation policymaking process resulted a poor quality plan.

Furthermore, many local authorities created the coastal management element and incorporated hazard mitigation in their plans as a formality to get the Hazard Mitigation Grant Program from the federal government, as is required (FEMA, 2013). As a result, the presence of the plan does not affect the funds spent for losses (Rovin, 2009). Rovin mentioned Florida as an example, where a 10-year study of Local Mitigation Strategy (LMS), a pilot program for DMA's planning requirement, has not given any positive change into the funds spent for Florida losses.

All of these challenges, as well as the fact that the coastal population and activities will keep growing, have made the effort of disaster mitigation and planning even harder to be more comprehensive and integrated in the future.

2.3 Coastal Hazard Mitigation Through Comprehensive Planning

Conventionally, one of the focuses of planning in the United States has been on the comprehensive plan (Rovin, 2009 b). One of the reasons is because this type of plan has been implemented by local authorities and encompasses large geographical area with a long-term time frame and wide range of topics. A long time ago, when comprehensive planning was called long term planning, it only occurred in limited number of conditions and commonly use in urban renewal areas (Sullivan, & Michel, 2003). Today, the comprehensive plan is a major policies document that is very

essential for the community planning process in both the state and local levels. It pictures how a community lives today and how they envision their future.

U.S federal government has been aware that comprehensive planning can accommodate many government concerns and help in solving many issues, for instance, on how comprehensive land use planning could give a significant effect to the environment quality (Tang, 2007; Pendall, 1998) and on building a more resilient community in high hazard areas (Cox, 2012; Schwab, 2011; Godschalk, Kaiser, & Berke, 1998). The idea of integrating a hazard element into comprehensive planning started when the Disaster Mitigation Act (DMA) 2000 was launched as the legal basis for FEMA mitigation planning requirements. DMA amended the Stanford Act and it was mentioned in the Stanford Act, Title II Disaster Preparedness and Mitigation Assistance, sec. 201 (42 U.S.C. 5131) (b):

> "The President shall provide technical assistance to the States in developing comprehensive plans and practicable programs for preparation against disasters, including hazard reduction, avoidance, and mitigation; for assistance to individuals, businesses, and State and local governments following such disasters; and for recovery of damages or destroyed public and private facilities" (The Stanford Act, 2013).

Since the passage of the Disaster Mitigation Act (DMA) of 2000, thousands of local governments in the U.S. have adopted hazard mitigation plans (Lewis, 2011). The plans were made to make local communities eligible for federal funding that can assist in pre-and post-disaster hazard mitigation activities. The first support for successful mitigation planning is support from local government (FEMA, 2002), since the local governments are responsible for enacting and/or enforcing zoning ordinances, land use plans, building codes, and other measures to protect life and

property. How local government supports can really be implemented is also explained by FEMA (2002): “Mitigation policies and activities should be incorporated into elements of the plan such as economic development, transportation, recreation, historic preservation, and housing”. A natural hazards element may also be desired through planning for future land uses by considering hazard constraints and opportunities, addressing environmental concerns, and incorporating hazard reduction into capital improvements and infrastructure elements (FEMA, 2013).

The Stafford Act also encourages states and local authorities to mandate the requirement of hazard mitigation elements in their comprehensive plans. As a result, the mandate has been translated into some specific regulations. For example, in Florida, state comprehensive plan required the local government to draw the Coastal High Hazard Area (CHHA). The presence of this requirement has directed the land planning to put away population from the CHHA (Smith, 2013; Florida Department of Community Affair, 2005).

Along with the legal basis, reducing hazard risk efforts through planning has been split in two ways. One is by incorporating it into the comprehensive planning regionally and locally and the second way is by making a stand-alone document called a Hazard Mitigation Plan. Many local governments have preferred to incorporate the hazard mitigation element in the comprehensive plan, and some have both. The local comprehensive plan, compared to the Local Hazard Mitigation Plan, has shown some advantage in term of its legal status. Courts have viewed the

comprehensive plan as a major policy document, and most state laws specify some degree of consistency between zoning and development decisions and the comprehensive plan. This gives the plan considerable weight in emphasizing a community's intent to implement the solutions it mentions, particularly with regard to development regulations (Schwab, 2011).

Schwab (2011) provides a list see table 2 of potential relevance of disaster types to disaster mitigation provisions in comprehensive plans.

Table 2. Potential Relevance Of Disaster Types To Disaster Mitigation Provision In Comprehensive Plans (Schwab, 2011)

Type of Plan Element	Flood	Coastal Hazards (Include Tsunami)	Seismic	Wildfire	Tornado	Landslide	Volcano
Hazards	x	x	x	x	x		x
Land Use	x	x				x	
Conservation	x	x	x	x		x	x
Public Facilities	x	x	x	x	x	x	x
Transport	x	x	x	x		x	x
Capital Improvements	x	x	x	x	x	x	x
Housing	x	x	x	x	x	x	
Historic Preservation	x	x	x	x		x	
Economic Development	x	x	x	x		x	
Recreational and Open Space	x	x	x (Near Fault Lines)	x		x	x
Environment	x	x	x	x		x	x
Implementation	x	x	x	x	x	x	x

Based on the list in table 2, it showed that all elements of comprehensive plans can potentially accommodate the mitigation provision of coastal hazards.

Recognizing that incorporating hazards mitigation into a comprehensive plan is not an easy task, there are serial key points to successfully integrating hazard mitigation into a comprehensive plan (Cox, 2012):

1. Hazard elements should be included
2. All comprehensive plan elements should be pinpointed, especially those areas where hazard mitigation plays a role in achieving goals of the plan
3. Develop the correlation between identified hazards in the hazard element and the specific chances for the hazards occurring and cross-reference them to explain where and how mitigation action reduce these problems
4. Plans with an implementation element should include specific arrangements, such as financing and timing, for how mitigation solutions will actually be achieved and by whom

Besides the comprehensive plan, hazards also are an element in Coastal Zone Management (CZM) plans. Similar to the mitigation plan, coastal zone management plans have been developed in two ways: stand-alone document usually a called Coastal Zone Management Program (CZMP) or incorporated in a comprehensive plan. Many places have both of them. The Coastal Management Program is a document consisting of strategies and policies in managing the future of coastal areas, as the goal is to gain safety for coastal communities' lives, property and the coastal ecosystem (NOAA, 2012).

Among the national, state and local levels, the local level of government is believed to get the direct impacts of any change in coastal zones because, culturally, local people's lives are tied to the coast (Gilbert, & Vellinga, 1990). Therefore, in addition to the localities' focus on hazard mitigation, coastal zone management initiatives have been applied by local jurisdictions. As local communities and coastal area are directly impacted by each other, the localities of coastal zone management and program have been developed as a direction toward more sustainable and resilienct coastal communities (Beatley, Brower & Schwab, 2002).

2.4 Local Comprehensive Planning Context in Reducing Hazard Risk Toward Resilienct Coastal Communities

Locality in planning is very essential. Because people and any of their activities are directly related to the environment where day-to-day live took place, the interrelationship among social, land use, economic activities, changes in environment and all of their complexities has switched the planning effort from top-down to bottom-up planning. Therefore, the local commitment to planning has a very important role in determining outcomes, especially when the planning has regional concerns that are mandated to be managed through policies and strategies at the local level (Norton, 2005).

As discussed on in sub-chapter 2.3 concerning coastal hazard mitigation through the comprehensive plan, all efforts of hazard mitigation, including the hazard mitigation plan, the comprehensive plan and coastal management are focused at the local level.

As an example, in coastal management, the way local authorities apply a coastal management program locally has varied. In Florida, the local comprehensive plan is required to have 9 elements (listed in Table 3), and one of them is a coastal management element (Arrant, 2012).

Table 3. Florida Comprehensive Plan Minimum Required Elements

Code	Required Elements
9J-5.006	Future Land Use Element
9J-5.010	Housing Element
9J-5.011	Sanitary Sewer, Solid Waste, Storm Water Management, Potable Water and Potable Water and Natural Ground Water Aquifer Recharge Element. (Infrastructure Element)
9J-5.012	Coastal Management
9J-5.013	Conservation Element
9J-5.015	Intergovernmental Coordination Element
9J-5.016	Capital Improvement Element
9J-5.019	Transportation Element
9J-5.025	Public School Facilities Element for Public School Concurrency

The coastal management element includes delineation of efforts to maintain and manage the overall quality of the coastal zone environment, including restoration, enhancement and maintenance. In addition, addressing potential hazards and the mitigation strategy are required in this element. For example, policies suggested in the coastal management element regarding hazards mitigation could include providing evacuation plans for hazards like hurricanes and limiting development in the Coastal High Hazard Area (CHHA) (Arrant, 2012).

In conclusion, land comprehensive plans in Florida have incorporated coastal management and hazards mitigation as a minimum requirement for local jurisdictions in preparing their local comprehensive plans. And, at the same time, some communities integrated disaster mitigation, coastal management, and comprehensive

plan altogether to achieve the goal of reducing the risk of hazards mitigation to lead toward a more resilient coastal community (see Figure 3).

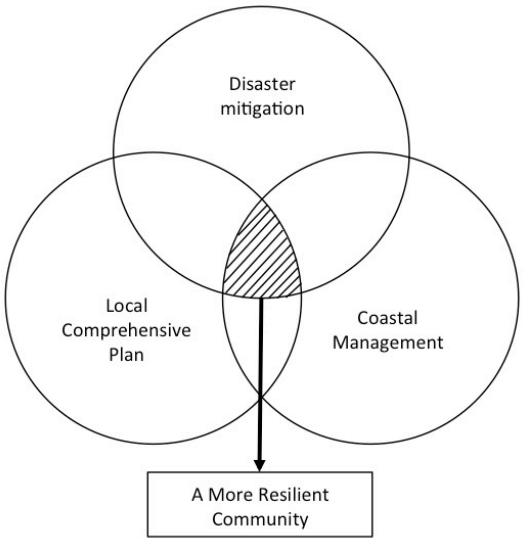

Figure 3. A more Resilient Community as the Crosscutting Result of Disaster Mitigation, Local Comprehensive Plan and Coastal Management

The Subcommittee on Disaster Reduction (SDR) identified four key characteristics of disaster-resilient community (Table 4):

1. Community recognizes and understands the relevant hazards in their area
2. Community at risk knows when a hazard is about to happen
3. Community and individual at risk are safe everywhere in the community
4. Community experiences minimum impact to life and economy after a hazard event

Table 4. Direct Crosscutting Impact Between Development Management and Resilience Community

Crosscutting	Development Management					
Resilience Community	Building Standards	Development Regulation	Critical and Public Facilities Policies	Land and Property Acquisition	Taxation and Fiscal Policies	Information Dissemination
Community understands relevant hazards						**x**
Community knows when hazards are about to happen						**x**
Every individual in the community is safe wherever they are	**x**	**x**	**x**	**x**		**x**
Minimum disturbance causes after hazards event				**x**	**x**	

X indicates the crosscutting impact on how development management strategies can achieve and increase community resilience

Chapter 3: Conceptual Framework

3.1 Methodology

3.1.1 Study Sample

To answer the questions posed in this study, a sample was developed to include 35 coastal counties in Florida. The selection of the 35 counties is based on the list provided by the Florida Department of Environmental Protection in the Florida Coastal Management Program (FDEP, 2012). The sample also was determined by the availability of the comprehensive plans at the local level with online-based data sources. The counties included in the study represent all coastal counties in Florida.

3.1.2 Data Collection

Plans were collected during January-February 2014. All of the plans were located via websites from state or county official planning websites. At this stage, plans were collected in downloadable, searchable PDF or Word formats. By the end of February, this resulted in the collection of 35 local comprehensive plans with no missing data. The data are limited to only local comprehensive plans, but one document titled "*growth management plan*" is also included because, in Florida, comprehensive planning is often referred to as growth management and since all counties provided all the downloadable documents online, all data were successfully collected in the fist stage of this research.

Figure 4 shows the 35 selected coastal counties in Florida. The coastal zone was restricted to areas within ten miles of the coast. There are two major ocean borders for the

Florida coast: The Gulf of Mexico and the Atlantic Ocean. The total coverage of the coastal counties covers 55% of Florida land area.

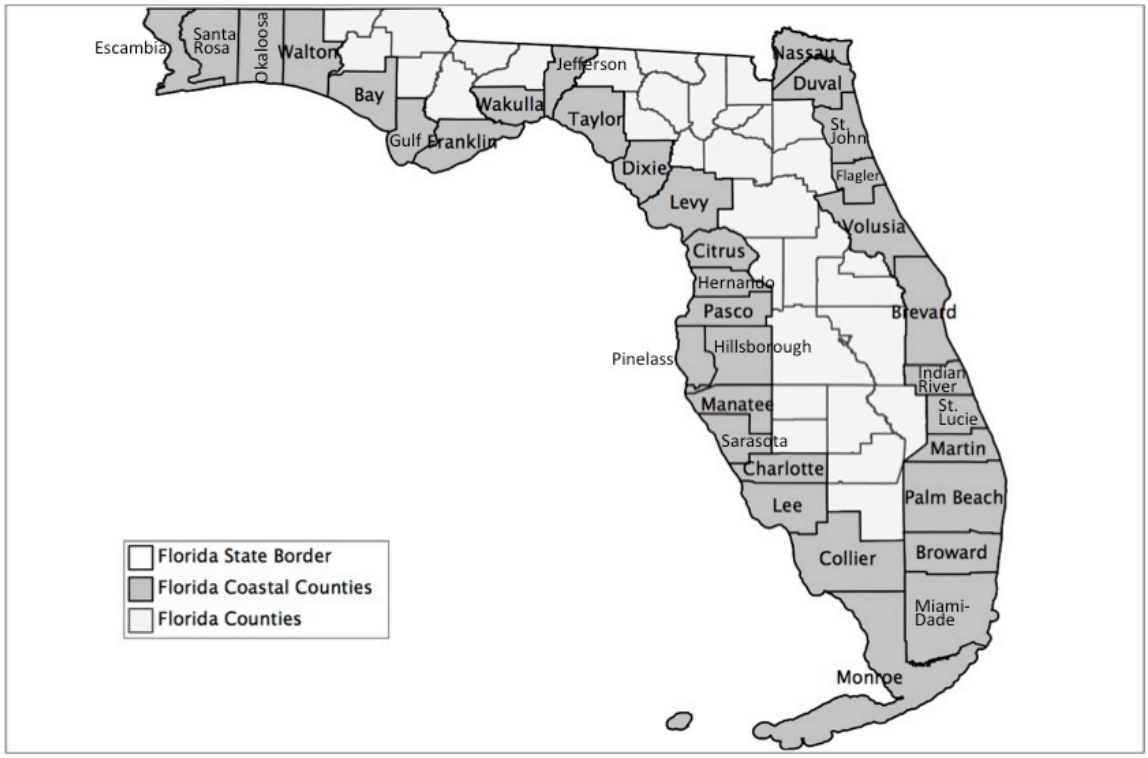

Figure 4. Selected Coastal Florida Counties with County Local Comprehensive Plans

The comprehensive plans for these counties are all mandated and approved by the Florida State Legislature as appropriate local comprehensive plans.

Table 5.Florida Coastal Counties

County Names	Comprehensive Plan Year	Tittle
Escambia	2013	Escambia County Comprehensive Plan 2030
Santa Rosa	2008	Santa Rosa county comprehensive Plan: 2008 - 2025
Okaloosa	2009	Okaloosa County 2020 Comprehensive Plan
Walton	2010	Walton County Comprehensive Plan
Bay	2010	Bay County Florida Comprehensive Plan
Gulf	2011	Gulf County Comprehensive Plan Revision

Franklin	N.A	Franklin County Comprehensive Plan
Wakulla	2013	Wakulla County Comprehensive Plan
Jefferson	2011	Comprehensive Plan 2025 Jefferson County Florida
Taylor	N.A	Taylor County Comprehensive Plan
Dixie	2009	Dixie County Comprehensive Plan
Levy	N.A	Levy county Comprehensive Plan
Citrus	1998	Citrus County Comprehensive Plan 1995-2020
Hernando	2013	Comprehensive Plan Hernando County, Florida
Pasco	2013	2025 Comprehensive Plan Pasco county, Florida
Pinellas	2008	Pinellas County Comprehensive Plan
Hillsborough	2008	Hillsborough Comprehensive Plan
Manatee	N.A	Manatee County Comprehensive Plan
Sarasota	2002	Sarasota County Comprehensive Plan
Charlotte	2010	Charlotte 2050 Comprehensive Plan
Lee	2013	The Lee Plan 2013 Codification
Collier	2002	Collier County Growth Management Plan and
Monroe	2010	Monroe County Year 2010 Comprehensive Plan
Miami-Dade	2009	Miami-Dade Comprehensive development Master Plan
Broward	2012	Broward County Comprehensive Plan
Palm Beach	2013	Palm Beach County Comprehensive Plan
Martin	2009	Comprehensive Growth Management Plan County of Martin, Florida
St. Lucie	2010	St. Lucie Comprehensive Plan
Indian River	2010	Indian River County 2030 Comprehensive Plan
Brevard	2013	Brevard County Comprehensive Plan
Volusia	2007	Volusia County Comprehensive Plan
Flagler	2010	Flagler County Comprehensive Plan 2010-2035
St. Johns	2010	St. John County 2025 Comprehensive Plan
Duval (*)	2009	2030 The City of Jacksonville Comprehensive Plan
Nassau	2010	Nassau County Florida 2010-2030 Comprehensive Plan

(*) *For Duval County Comprehensive, the best document obtained was The City of Jacksonville Comprehensive Plan*

3.1.3 Data Analysis:

Evaluation Criteria:

For this study, a matrix (Appendix 1) was developed for evaluating the development management policies content in local comprehensive plans that were collected. The evaluation criteria were established by reviewing the literature of the development management policies used as a tool of hazard mitigation (Olshansky & Kartez, 1998; Burby et al., 2000) and adopting previous research regarding plan evaluation and hazard mitigation content that has been established (Burby, 1998; Tang, 2010; Berke, 2012; FEMA, 2013). The criteria for evaluation are divided into six components: 1) Building Standard and Construction Details, 2) Development Regulation, 3) Critical and Public Facilities 4) Land and Property Acquisition, 5) Taxation and Fiscal Policies and 6) Information Dissemination

1. **Building Standards and Construction Details**
    1. Building codes,
    2. Flood-proofing requirements
    3. Seismic standards
    4. Retrofit requirements
2. **Development Regulations**
    1. Zoning regulation
    2. Flood zone regulation
    3. Setback
    4. Sensitive land protection

3. **Critical and Public Facilities**
    1. Long-term capital improvement program
    2. Siting public facilities and schools at hazard free area
    3. Incentive to private facilities to avoid sensitive or hazardous area
4. **Land and Property Acquisition**
    1. Development rights
    2. Transfer of development rights
    3. Relocation of buildings and uses
5. **Taxation and Fiscal Policies and**
    1. Transfer of public costs to owner or developer of property within hazardous area (impact fee)
6. **Information Dissemination**
    1. Sharing public information
    2. Hazard disclosure requirements
    3. Warning signage in hazardous areas

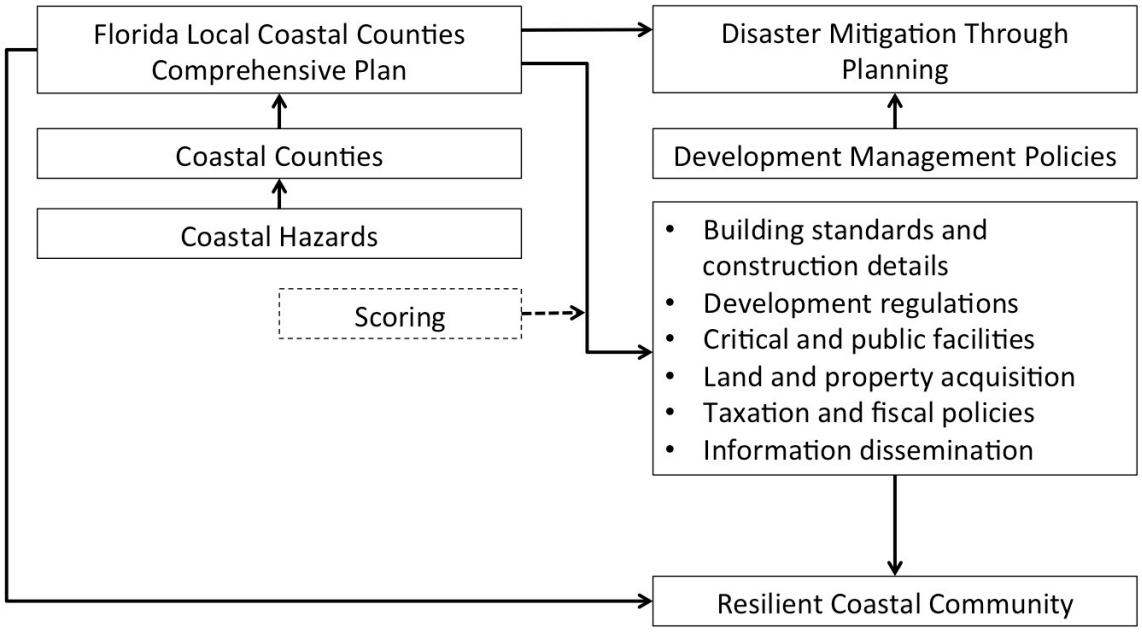

Figure 5. Conceptual Framework of the Analysis

Figure 5 explains the conceptual framework of the analysis process in this research. To have a more resilient coastal community, coastal counties have adopted hazard mitigation strategies. This research specifically examines the adoption of development management strategy measured by the six components (major policies) that later will be evaluated by finding the existence of each component categories (sub-policies) to see whether each sub-policies mention or not mention in coastal management element of the local comprehensive plans. The finding converted into two scores that will be explained in the coding protocol.

3.2 Coding Protocol

The adoption of development management policies was measured by evaluating comprehensive plans for each sample jurisdiction against the six principles of development management: 1) Building Standards and Construction Details, 2) Development Regulations, 3) Critical and Public Facilities 4) Land and Property

Acquisition, 5) Taxation and Fiscal Policies and 6) Information Dissemination. Within each of the areas each indicator is scored on a scale of 0-1. A score of "0" indicates that that indicator in not mentioned or included in the plan; a score of "1" means that an indicator is mentioned in the document.

3.3 Total and Component Scores

The content of development management in local comprehensive plans was measured by adapting, with some adjustment, to previous research (Tang, 2013) of total plan quality and plan components quality that can be calculated by the following equation:

$$PC_i = \frac{\sum I_i}{m_i} * 100 \quad (1)$$

$$TPQ = \frac{\sum PC_i}{6} \quad (2)$$

Where $\mathbf{PC_i}$ represents the quality of the i^{th} plan component (ranging from 0-100%); $\boldsymbol{m_i}$ represents the number of indicators within the $\boldsymbol{i^{th}}$ plan component; $\boldsymbol{I_i}$ represents the $\boldsymbol{i^{th}}$ indicator's score (ranging from 0-1); and ***TPQ*** is the plan's total quality scores (ranging from 0-100%). The indicators (policies) needed to evaluate each plan component are listed under each component in section 3.1.3 of this document.

Chapter 4: Results And Discussion

4.1 Descriptive Statistics for Development Management Policies Adoption of The Coastal Management Element

The descriptive analysis for each policy and total adopted policies are listed in Table 6. From the table, the mean score for total policies adoption score is 0.53 on a scale of 0-1. This mean score for the total policies adoption score indicates that the local jurisdictions have incorporated average of 53% of the total policies measuring the development management strategy in their Coastal Management Element of the local Comprehensive Plans. This is neither weak nor strong, but shows enough effort of the local jurisdiction to adopt the development management policies in their coastal management element of the comprehensive plans.

Table 6. Descriptive Statistics for Development Management Policies Adoption of The Coastal Management Element

Policies Measurement	N	Minimum	Maximum	Mean	Standard Deviation
Building Standards and Construction Details	35	0	0.75	0.53	0.23
Development Regulations	35	0.25	1	0.71	0.25
Critical and Public Facilities	35	0	1	0.64	0.30
Land and Property Acquisition	35	0	1	0.72	0.37
Taxation and Fiscal Policies	35	0	1	0.31	0.47
Information Dissemination	35	0	1	0.30	0.28
Total Policies Adoption Score	**35**	**0.04**	**0.81**	**0.53**	**0.18**

Among the six major policies measuring the development management strategy, land and property acquisition and development regulation have the highest mean score each, 0.72 and 0.71. This indicates that these two major policies in general

(accumulated by the sub policies) are the most adopted major policies by Florida coastal counties. Following them, critical and public facilities and building standards and construction details are two other major policies in the middle, scoring 0.64 and 0.53. These scores show that, on average, more that half of the policies (in total) have been adopted and present the indicators. Even though they have a middle scores, critical and public facilities and building standards and construction details more stand out compared to the last two major policies, taxation and fiscal policies and information. The low scores of only 0.31 and 0.30 indicate that the local jurisdictions have given less attention to these two major strategies.

Overall, since the value of the standard deviation of the total adoption of each policy is less than 1, generally there are no big differences among the local jurisdictions on whether they adopted the major policies.

4.2 Total Policies Adopted in Each Jurisdiction

The low value of the standard deviation mentioned before is answered from the data provided in Table 6. As presented in the table, there are no significant variations among how each jurisdiction has in general adopted the major policies of development management strategy in their coastal management element of the comprehensive plan.

Table 7. Total Policies Adopted in Each Jurisdiction

Jurisdiction	BSCD	DR	CPF	LPA	TFP	ID	Total (Out of 6)	%
Escambia	0.75	1.00	1.00	0.67	1.00	0.00	4.42	74%
Santa Rosa	0.25	0.75	0.67	1.00	1.00	0.00	3.67	61%
Okaloosa	0.50	1.00	0.33	1.00	0.00	0.00	2.83	47%
Walton	0.75	1.00	0.67	0.33	1.00	0.67	4.42	74%
Bay	0.25	0.50	0.67	1.00	0.00	0.00	2.42	40%
Gulf	0.50	0.75	0.67	0.00	0.00	0.00	1.92	32%
Franklin	0.75	0.25	0.33	0.00	1.00	0.67	3.00	50%
Wakulla	0.50	0.50	0.67	0.33	0.00	0.33	2.33	39%
Jefferson	0.00	0.25	0.00	0.00	0.00	0.00	0.25	4%
Taylor	0.50	0.25	0.33	0.33	0.00	0.33	1.75	29%
Dixie	0.50	0.25	0.67	0.33	0.00	1.00	2.42	40%
Levy	0.50	1.00	0.33	1.00	0.00	0.00	2.83	47%
Citrus	0.25	0.50	0.67	0.67	1.00	0.67	3.75	63%
Hernando	0.50	0.75	0.67	1.00	0.00	0.33	3.25	54%
Pasco	0.75	0.50	1.00	1.00	0.00	1.00	4.25	71%
Pinellas	0.25	0.75	0.67	0.33	0.00	0.33	2.33	39%
Hillsborough	0.50	0.75	0.67	0.33	0.00	0.00	2.25	38%
Manatee	0.25	0.75	0.33	1.00	0.00	0.67	3.00	50%
Sarasota	0.50	1.00	0.67	0.33	1.00	0.33	3.83	64%
Charlotte	0.75	0.50	0.67	1.00	1.00	0.33	4.25	71%
Lee	0.50	1.00	1.00	1.00	1.00	0.33	4.83	81%
Collier	0.75	1.00	1.00	0.67	1.00	0.33	4.75	79%
Monroe	0.75	0.75	0.67	1.00	1.00	0.00	4.17	69%
Miami-Dade	0.75	0.50	0.33	1.00	0.00	0.33	2.92	49%
Broward	0.25	0.50	0.00	0.00	0.00	0.00	0.75	13%
Palm Beach	0.75	0.75	0.67	1.00	0.00	0.33	3.50	58%
Martin	0.75	0.75	1.00	1.00	0.00	0.33	3.83	64%
St. Lucie	0.75	1.00	0.67	1.00	0.00	0.33	3.75	63%
Indian River	0.00	0.50	0.00	1.00	0.00	0.00	1.50	25%
Brevard	0.50	0.75	0.67	1.00	0.00	0.33	3.25	54%
Volusia	0.75	0.75	1.00	1.00	0.00	0.33	3.83	64%
Flagler	0.75	1.00	0.67	1.00	0.00	0.33	3.75	63%
St. Johns	0.25	0.75	1.00	1.00	1.00	0.33	4.33	72%
Duval	0.75	1.00	1.00	1.00	0.00	0.33	4.08	68%
Nassau	0.75	0.75	1.00	1.00	0.00	0.00	3.50	58%

Note:
BSCD : Building Standards and Construction Details
DR : Development Regulations
CPF : Critical and Public Facilities
LPA : Land and Property Acquisition
TFP : Taxation and Fiscal Policies
ID : Information Dissemination

There are only five out of 35 local jurisdictions (or 15%) that have extreme gaps in the total policies adoption score. Three of the five jurisdictions have the lowest score, where they adopted only 25% or less of the 6 policies. They are: Indian River (25%), Broward (13%) and Jefferson (4%). These three counties have the weakest development management strategy in their coastal management element. On the other hand, two of the five jurisdictions with extreme score gaps are Collier (79%) and Lee (81%) both of which have shown a strong effort incorporating the development management strategies in their coastal management element of their comprehensive plans.

The rest, 30 out of 35 (or 85%) counties have scores ranging from 1.75 – 4.42 out of 6, or 26% to 74% of the total score, where 34% of all counties (12 local jurisdictions) scored 1.75-3 out of 6, or 29% to 50%, of the total score and 51% of all jurisdictions (18 local jurisdictions) scored 3.25–4.42 out of 6, or 54%-74% of the total score. To see the overall picture of the results, Figure 6 is a GIS map that shows the spread of scores among the 35 local jurisdictions in four equal break the percentage categories:

1. Scored 0 – 25% of the total adoption scores
2. Scored 26% – 50% of the total adoption scores
3. Scored 51% – 75% of the total adoption scores
4. Scored 76% – 100% of the total adoption scores

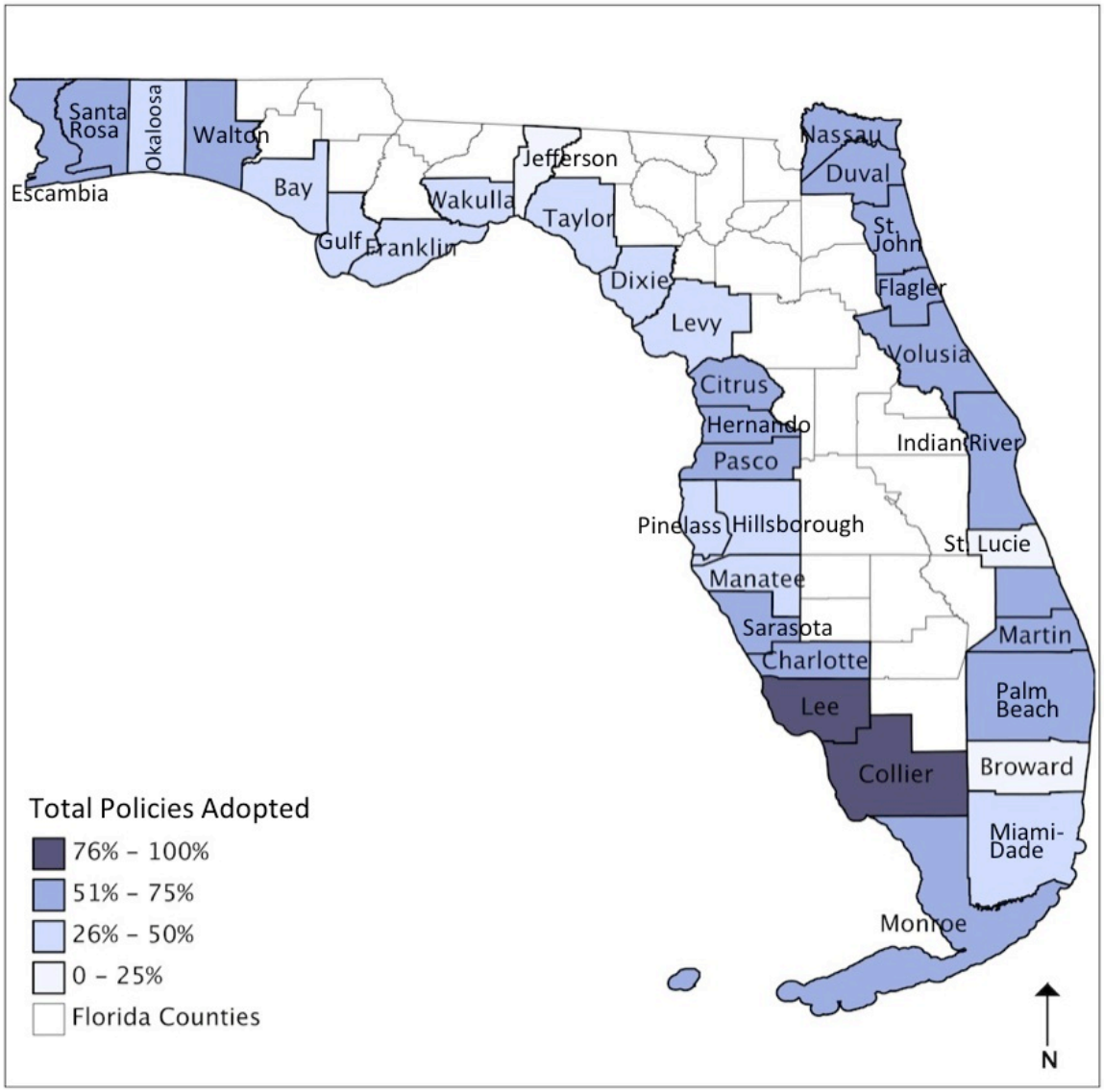

Figure 6. Map of Total Policies Adopted in Each Jurisdiction

An interesting finding from the final score results and the map in Figure 6 is that the two counties with the highest policies adoption score Lee and Collier are located next to each other. Another obvious result is that some other jurisdictions with same range of scores are also grouped together (formed by 2 to 3 counties). Only the counties with the lowest total scores are spread out. This might indicate that there is influence of intergovernmental collaboration in improving their coastal management strategies,

but this assumption will need to be proven in future research and is suggestion for the further development of this research.

4.3 Most Adopted Policies and Indicators Measurement

The total score of the major policies adopted, measuring the development management strategy of the coastal zone management element, is determined based on the scores assigned to all of the individual policies. In measuring the adoption of development management strategy, each of the six major policies has 3 to 4 policies (sub-policies) except for the taxation and fiscal policy, which only have one sub-policy (see section 3.1.3 of this document). The policies vary in the way they appear in the coastal management element of the comprehensive plans. Some are mandatory, some are only mentioned associated with other policies, and some only provide information that refers to another chapter in the comprehensive plan document.

Since this research has focused on determining whether individual policies are mentioned or not by their presence in the document, a more detailed analysis of how each policy may have been applied in different jurisdictions is now explained further explained in this section. The rationale of this research is that once the policy is mentioned in the coastal management element, that means the policy exists in the comprehensive plan document and there is an effort of the local jurisdiction to incorporate the development management policies in the coastal management element, which also means integrating the hazard mitigation efforts into coastal management and the comprehensive plan.

Table 8. Most Frequently Adopted Policies in Coastal Management Element

No	Policies	Score (0-35)	Score Percentage
1	Sensitive land protection	35	100%
2	Relocation of building and use	29	83%
3	Si ting public facilities and school at hazard free area	28	80%
4	Retrofit requirement	26	74%
5	Building codes	25	71%
6	Long-term capital improvement program	24	69%
7	Development right	24	69%
8	Flood proofing requirements	23	66%
9	Setback	23	66%
10	Transfer development right	23	66%
11	Sharing public information	23	66%
12	Flood zone regulation	22	63%
13	Zoning regulation	19	54%
14	Incentive to private facilities to avoid sensitive or hazardous area	15	43%
15	Taxation and fiscal policy	11	31%
16	Hazard disclosure requirement	6	17%
17	Warning signage in hazardous area	1	3%
18	Seismic standard	0	0%

Table 8 provides a list of sub-policies that are presented or mentioned in the coastal management elements of the 35 local coastal comprehensive plans in Florida. The top three policies, most adopted by more than 80% of the total local jurisdictions, indicate that most local jurisdictions have focused their coastal management development strategies on sensitive land protection, relocation efforts and siting focal public facilities in hazard free areas.

An interesting finding from the quantitative analysis of the documents is that, even though it is mandatory for local jurisdiction to have a coastal management element in their comprehensive plans, instead of having the coastal management as a single chapter like what most local jurisdictions have done, some counties have associated

the coastal management element with the required conservation element. Table 9 shows how each jurisdiction presents the coastal management element in its comprehensive plan.

Table 9. Coastal Management Element In Comprehensive Plan

County Names	Coastal Management Element In Comprehensive Plan
Escambia	Chapter 11 Coastal Management
Santa Rosa	Chapter 7 Coastal Management
Okaloosa	Chapter 2.9 Coastal Management
Walton	Chapter 2 Coastal Zone Conservation Element
Bay	Chapter 7 Coastal Management
Gulf	Chapter 5 Coastal Management
Franklin	Chapter 5 Coastal/Conservation
Wakulla	Chapter 6 Coastal/Conservation
Jefferson	Chapter 6 Coastal Management Element
Taylor	Chapter 9 Coastal Management Element
Dixie	Chapter 9 Coastal Management Element
Levy	Chapter 3 Coastal Management Element
Citrus	Chapter 4. Coastal, Lakes and River Management
Hernando	Chapter 9 Coastal Management
Pasco	Chapter 4 Coastal management Element
Pinellas	Chapter 4 Coastal management Element
Hillsborough	Chapter 4 Coastal management Element
Manatee	Chapter 3 Coastal Management
Sarasota	Chapter 2 Environment
Charlotte	Coastal Planning Element
Lee	Chapter 7 Conservation and Coastal Management
Collier	Conservation and Coastal Management Element
Monroe	Conservation and Coastal Management
Miami-Dade	Chapter 7 Coastal Management Element
Broward	Chapter 10 Coastal Management Element
Palm Beach	Chapter 8 Coastal Management Element
Martin	Chapter 8 Coastal Management Element
St. Lucie	Chapter 5 Coastal Management Element
Indian River	Chapter 12 Coastal Management Element
Brevard	Chapter 10 Coastal Management Element
Volusia	Chapter 11Coastal Management Element
Flagler	Chapter 5 Coastal Management Element
St. Johns	Chapter 5 Coastal/ Conservation Element
Duval	Chapter 5 Conservation Coastal Management
Nassau	Chapter 10 Coastal Management Element

As seen in Table 9, there are four types of titles for the coastal element. First; the regular one which is mandated by the State of Florida, coastal management element; second: conservation and coastal management; third: coastal zone conservation element; and fourth: environment element, which by name has no "coastal" key word.

4.3.1 Building Standards and Construction Details

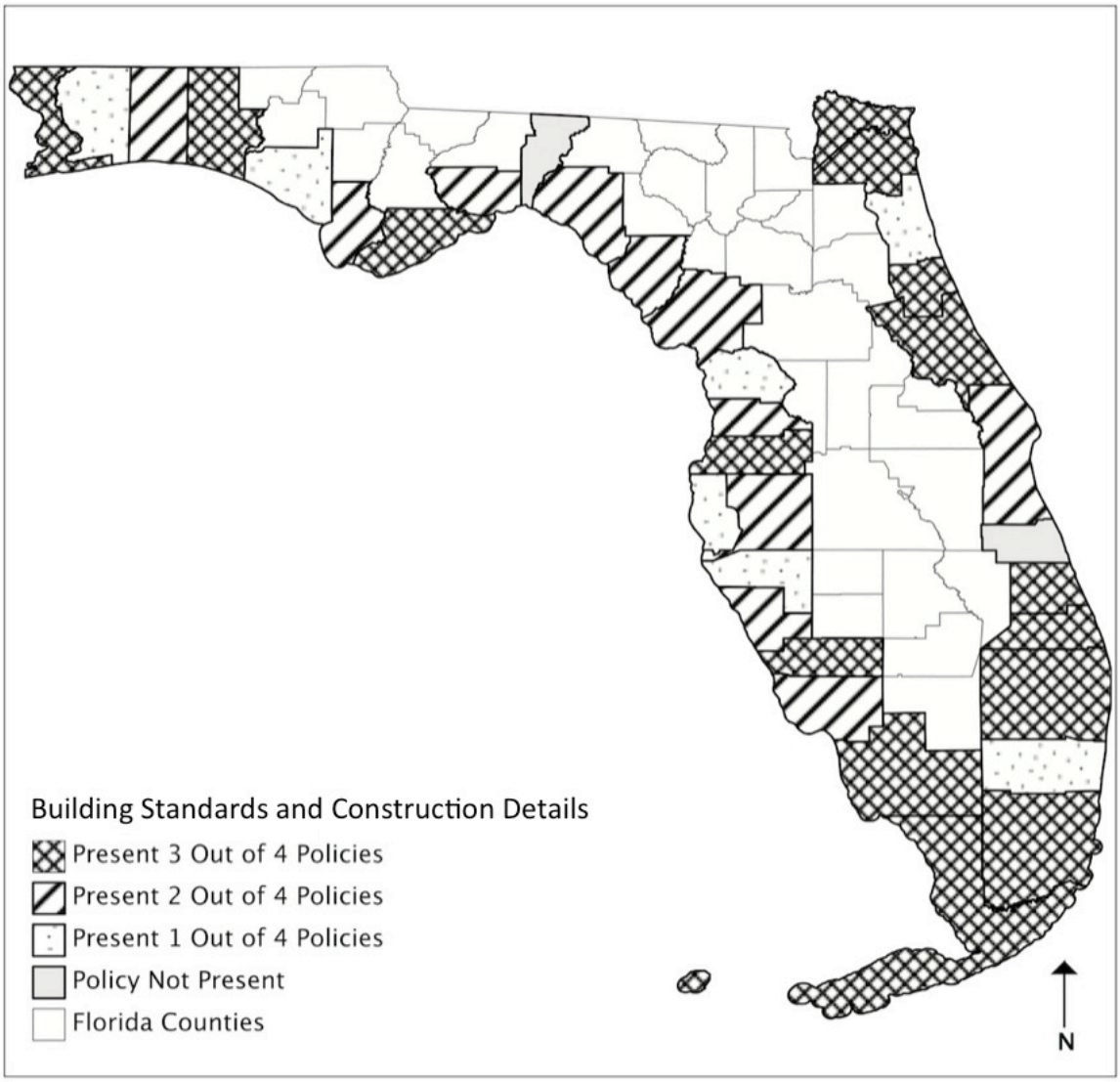

Figure 7. The Adoption of Building Standards and Construction Details

Figure 7 shows how the building standards and construction details policy has been adopted in Florida coastal counties. The map indicates that most counties have adopted three out of four policies and two out of four policies, and only some have adopted only one policy. Only two of the jurisdictions have not mentioned anything about a building standards and construction details policy in their coastal management element.

Building standards and construction details policies is the fourth most adopted policy category among the six major policy categories. The highest total score for this policy category is 75%, due to the absence of one sub-policy (seismic standard regulation) in every jurisdiction. None of the local jurisdictions has explained anything about potential of seismic activities that need a certain standard for building regarding events like an earthquake.

4.3.1.1 Building Codes Policy Adoption

Even though the building standards and construction details policy category ranked fourth out of six in the total adoption result, building codes is one of the most adopted sub-policies, fifth out of 18 sub-policies, with the rate of adoption of 71%. The way each county adopted this policy varies. Most of them are just mentioned with no details of regulation but some strictly mandated and regulated the building codes to be followed. For examples, Okaloosa County specifies that the construction standards for new and redevelopment should follow the Florida Building Code. Some other county comprehensive plans stated, instead of directly

mandating the policy to be followed, mentioned the policy only as a reference. For instance, Citrus County, new construction or expansion of specific residential occupancy uses, as defined by the Florida Building Code (First Edition, Chapter 3, Section 311), are not allowed anywhere within the Coastal High Hazard Area.

4.3.1.2 Flood Proofing Requirement Policy Adoption

Ranked eight out of 18 sub-policies, flood-proofing requirements have been adopted by 66% of the total jurisdictions. Most jurisdictions only mention the policy. Only counties that experience significant flood hazard events like Escambia county, strictly regulated the policy and require specific action for instance required additional elevation above the base flood to reduce exposure.

4.3.1.3 Seismic Standard Policy Adoption

None of the jurisdiction has included anything about seismic standard to be considered in the building standards category. This possibly is because seismic activities are not a major hazard in Florida, even though Florida has experienced some earthquakes. The most recent is the Gulf of Mexico earthquake in 2006, but no fatalities were reported in this very rare earthquake event.

4.3.1.4 Retrofit Requirement Adoption Policy Adoption

Similar to the building code policy, retrofit requirements are also some of the most adopted policies, ranking fourth out of 18 policies with the rate of adoption at 74%. In terms of the way they are being adopted, retrofit

requirements got more attention, and most local jurisdictions mention them a “post-hazard mitigation strategy”.

4.3.2 Development Regulations

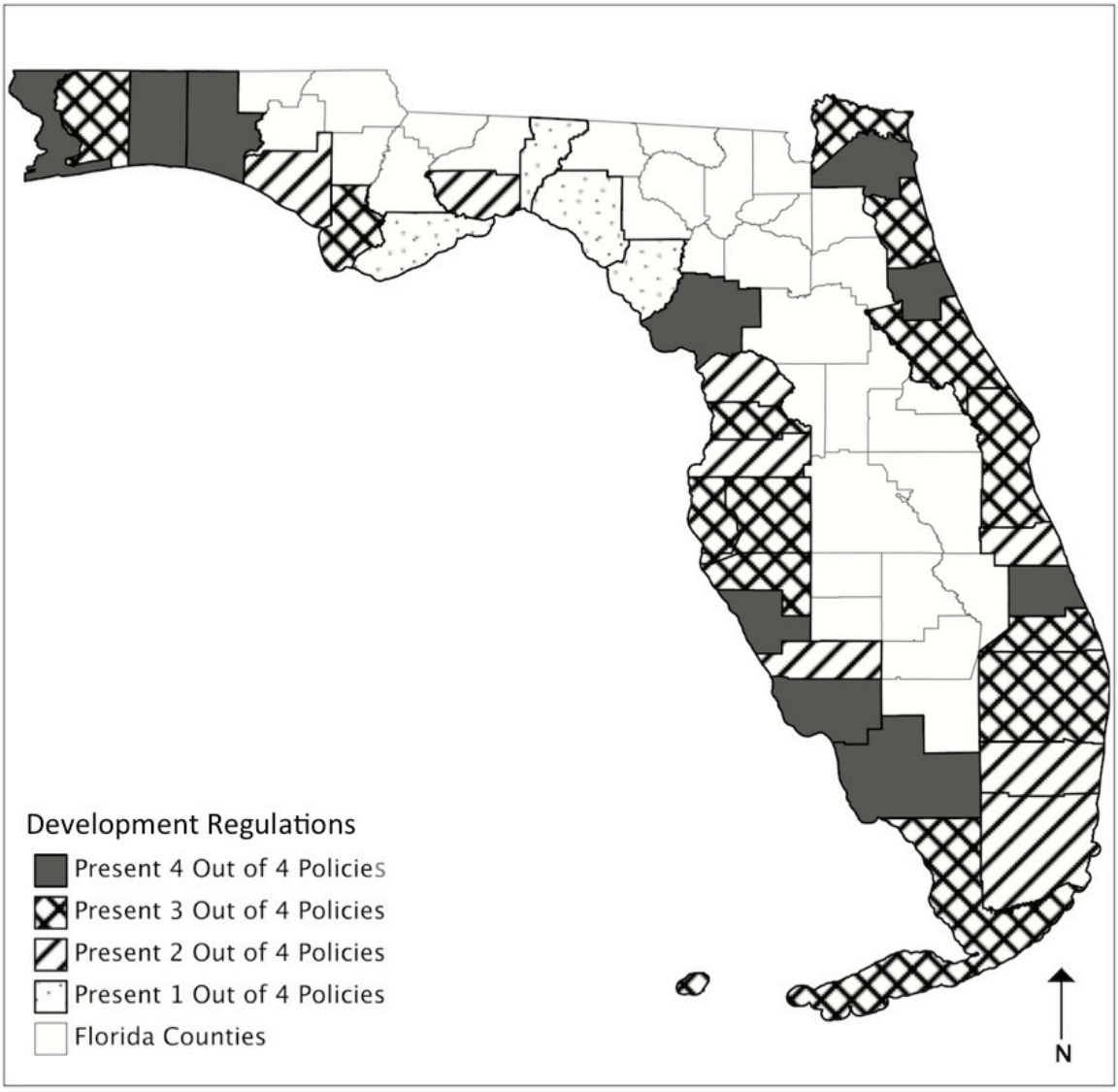

Figure 8. The Adoption of Development Regulations

Figure 8 shows how the development regulation policy has been adopted in Florida coastal counties. The map indicates that most counties have adopted three to four policies out of four policies. The result indicates that local jurisdictions give good attention to the major policies. Among 35 counties, only 4 counties

have adopted only adopted one out of the four policies measuring development regulations and none of the counties have adopted none of the policies. This is one of the reasons of why development regulations is the second most adopted among the six major policy categories. One of the policies, sensitive land protection, has an adoption rate of 100%. This is the only policy among 18 sub-policies that has been adopted by all jurisdictions.

4.3.2.1 Zoning Regulation Policy Adoption

Zoning regulations, which have been known as one of the tools of hazard mitigation, are moderately adopted in the coastal management element of the comprehensive plan. The rate of adoption, 54%, indicates that some local jurisdiction do not really think that it is necessary to associate zoning regulations or even to mention it in the coastal management element. The potential reason is because the land use element is where this policy normally belongs.

Besides the fact that zoning regulations are moderately used in this policy category, the interesting result is that this 54% of local jurisdiction are aware to adopt the policy and integrate it with the effort to address coastal conservation and disaster mitigation. Some counties like Okaloosa gives detailed directions for what kind of development is allowed in certain zones, while others don't really give details but highly encourage their new development or development to follow the existing zoning regulations or zoning map.

4.3.2.2 Flood Zone Regulation Policy Adoption

Slightly different from zoning regulations, flood zone regulations are also moderately adopted by the local jurisdictions, with a slightly higher rate of adoption, 63%. Most jurisdictions mention flood zones defined by the FEMA regulated flood plain and 100-year flood zone. Most of the policies are not detail and as refer to and associate the policy with the FEMA flood insurance program.

4.3.2.3 Setback Policy Adoption

It is interesting to find that even though all of the jurisdictions directly face the coast with a significant shoreline, only 66% of the jurisdictions have really regulated ta setback policy in their coastal management element. Santa Rosa is a good example, where it regulates a setback for the development along the shoreline of the Gulf of Mexico.

4.3.2.4 Sensitive Land Protection Policy Adoption

As mentioned earlier, sensitive land protection policies have been adopted by all local jurisdictions. Not only have this policies has been adopted by all of the jurisdictions. Not only have these policies been adopted by all jurisdictions, they also are mandatory regulations that mentioned specific areas like specific area, like wetlands, special habitats or other sensitive lands. Interestingly, this is the only policy in which almost all jurisdictions give similar details.

4.3.3 Critical and Public Facilities

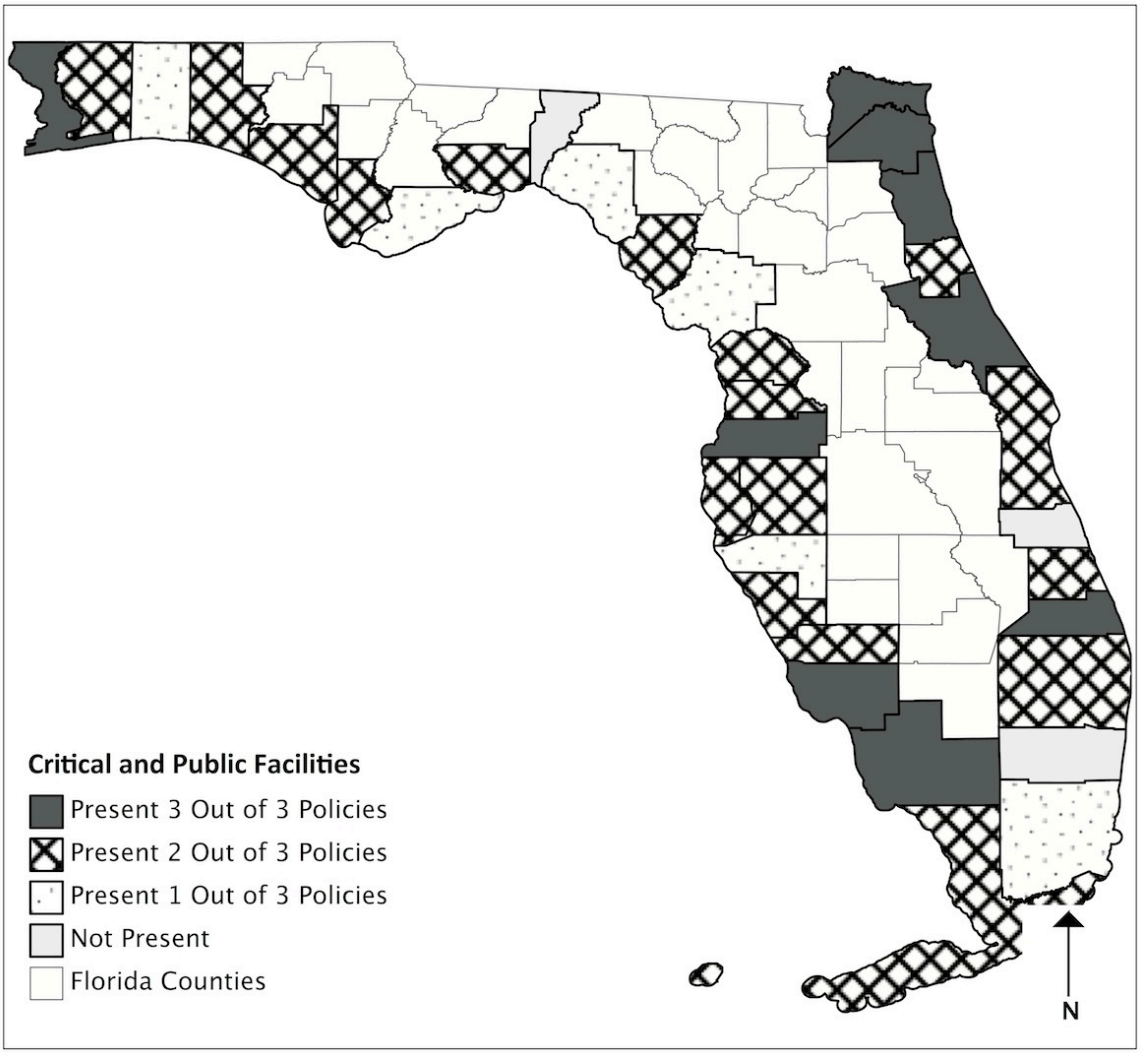

Figure 9 The Adoption of Critical and Public Facilities Policy

Figure 9 shows how the critical and public facilities policy has been adopted in Florida coastal counties. The map indicates that most counties have adopted two out of three policies, followed by jurisdictions that have adopted all policies and only some that have only adopt one policy. Only three of the jurisdictions have not mentioned anything about critical and public facilities policies in their coastal management element.

This policy category ranked third as the most adopted policy category among the six policy categories. One of the sub-policies in this category also ranked third among 18 sub-policies, which is the siting of public facilities and school in hazard free areas.

4.3.3.1 Long Term Capital Improvement Policy Adoption

One interesting result relative to the long-term capital improvement policy adoption in the coastal management element is that, even though this policy is a mandatory chapter in the comprehensive plan, 69% of the local jurisdictions also incorporate this policy in the coastal management element. Most counties mention or present this policy as a reference to the long term capital improvement policy chapter, which avoids overlapping content. Some use it as a reference and give some information about which part of the coastal management program that should be added or considered in the capital improvement proposal. This finding in contrast to the zoning regulation policy that also has its own chapter (land use element), has showed that it is possible to integrate the policies to the coastal management element.

4.3.3.2 Siting Public Facilities and School at Hazard Free Area Policy Adoption

This is the third most adopted policy. Eighty percent of the 35 jurisdictions have adopted this policy. This is a standout finding because public facilities and schools are regulated in not one single chapter but two different elements of the comprehensive plans of most local jurisdictions.

This again as well as long term capital improvement elements is contrast with the adoption of zoning regulation policy in coastal management element.

The significant adoption rate of this policy is potentially due to the existence of the Coastal High Hazard Area (CHHA) that has been drawn and set by the state government of Florida with one of the goals is to protect people and property from the exposure of risk in this area. Therefore avoiding focal infrastructures have been all jurisdiction focus and 80% of them are shown in the coastal management element.

4.3.3.3 Incentives to Private Facilities to Avoid Sensitive or Hazardous Area Policy Adoption

Incentives to private facilities to avoid sensitive or hazardous area policy adoption were mentioned in a small number of coastal management elements. Fewer than half of the total jurisdictions evaluated in this research (43%) adopted the incentive to private facilities to avoid sensitive or hazardous area but some jurisdictions have placed more attention on giving incentives to private facilities to avoid sensitive areas like wetlands or green space.

4.3.4 Land and Property Acquisition

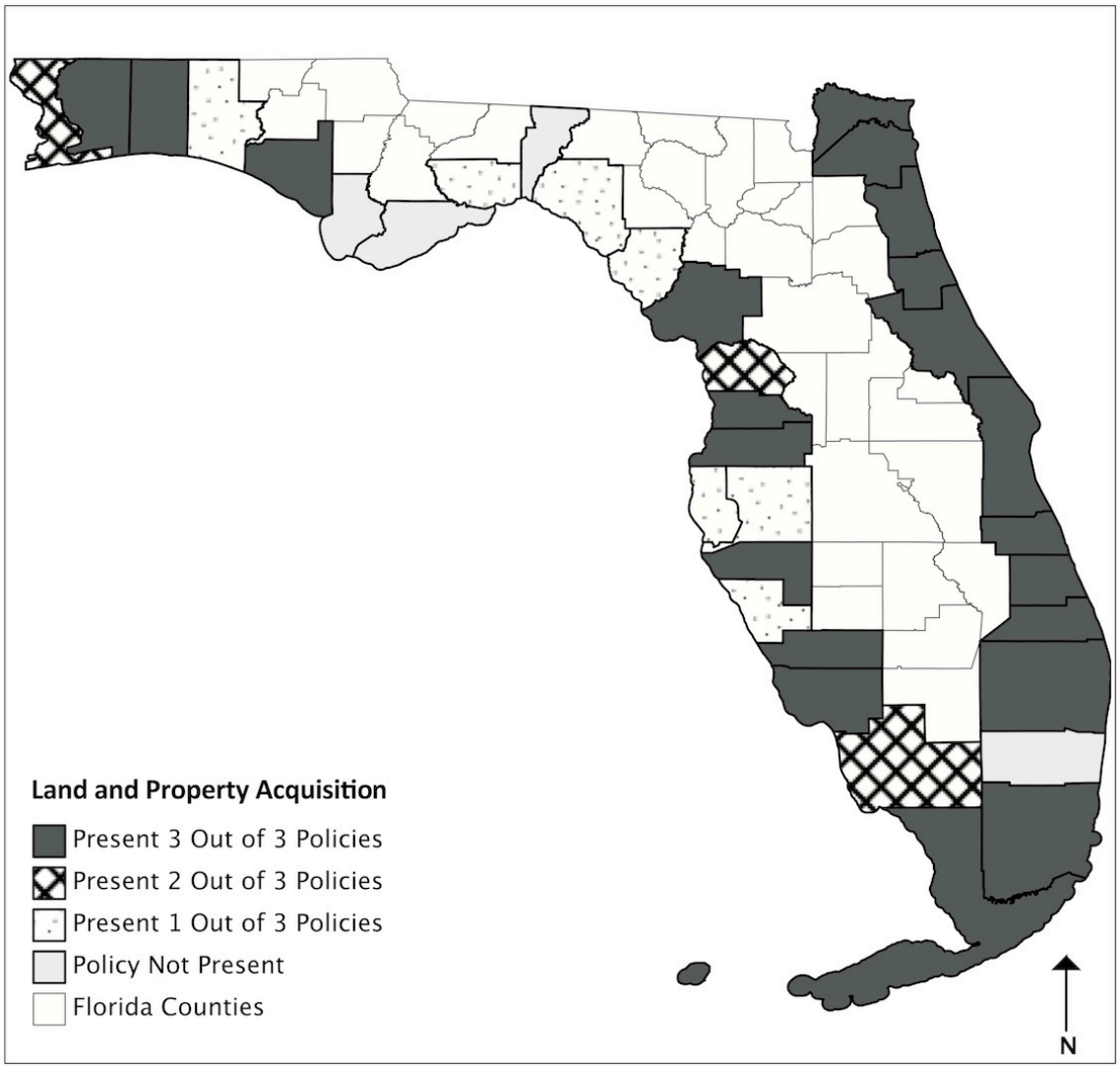

Figure 10. Land and Property Acquisition Policy

Figure 10 shows how the land and property acquisition policy has been adopted in Florida coastal counties. The map indicates that more than half of all counties have adopted all three out of the three policies, followed by jurisdictions that adopted one out of three policies. Three counties adopted two out of three policies, and four jurisdictions have adopted no land and property acquisition policies in their coastal management elements.

Ranked first among the six major policy categories, this policy stands out to be the most considered development management strategy in the coastal management element in comprehensive plans of Florida coastal counties. With the percentage of overall policies adoption 72% and more than 50% of the local jurisdictions adopt three out of the three policies, the result indicates that this policy category has been seen important by the local jurisdiction and need to be incorporated in the coastal management element even though it might have been explained in another comprehensive plan element like land use element.

Most of the local jurisdictions mentioned land and property acquisition policy in general way. It is mentioned as an open opportunity and consideration. So, any potential acquisition effort (all the three listed or other types of acquisition) will be considered based on the availability of funding and certain conditions. Some other jurisdictions provide details of preferred development right, transfer development right, and relocation effort and others only mentioned one of them. But as seen on the map, not significant number of jurisdictions adopted one out of the three policies and most of jurisdictions adopted all three out of the three policies.

4.3.4.1 Development Right Policy Adoption

Development right policy ranked seventh among the 18 sub-policies. This number indicates that development right policy has moderately adopted in the coastal management element of most jurisdictions. The way each

jurisdiction mention this policy varies in two ways: direct and indirect. Directly mentioned, some local jurisdictions have regulated the plan of development right as an effort of acquisition action by the government and some even with well preparation for instance, describing potential partners to cooperate like private sectors and non-governmental organizations. Some counties also describe the reason or the intention of the acquisition through development right policy.

Indirectly mentioned, some local jurisdictions have mentioned this policy in general way as mentioned in the opening of this section, most jurisdictions have opened possibilities of any acquisition effort, therefore the development right policy is counted as "mentioned" even though the key word of "development right" is not specifically mentioned in the coastal management element.

4.3.4.2 Transfer Development Right Policy Adoption

Slightly different from development right adoption, transfer development right is also mentioned in two ways and most jurisdictions mention it as an open possibility of appropriate effort of land acquisition. This is the reason to count transfer development right as "mentioned" even though the key word of "transfer development right" is not directly mention in the coastal management element. Among 18 policy categories, transfer development right ranked tenth among the 18 policy categories.

4.3.4.3 Relocation of Building and Use Policy Adoption

Compare to the other two policies, relocation has gotten a very good attention from the local jurisdictions. Ranked second, most adopted policy among the 18 sub-policies, relocation has been adopted by 83% jurisdictions. The counties that only mention one out of the three policy categories of land acquisition policy, most of them only adopt relocation. One of the reasons is because this policy category is one of the most adaptive actions especially in the after event of natural hazard like hurricanes, which is a huge disaster in Florida.

Each jurisdiction has mentioned the relocation of building and use policy category similar to the adoption of development right and transfer development right policy. What make this policy stands out is because most jurisdictions have mentioned it directly and regulated it as one of after-disaster emergency actions.

4.3.5 Taxation and Fiscal Policies

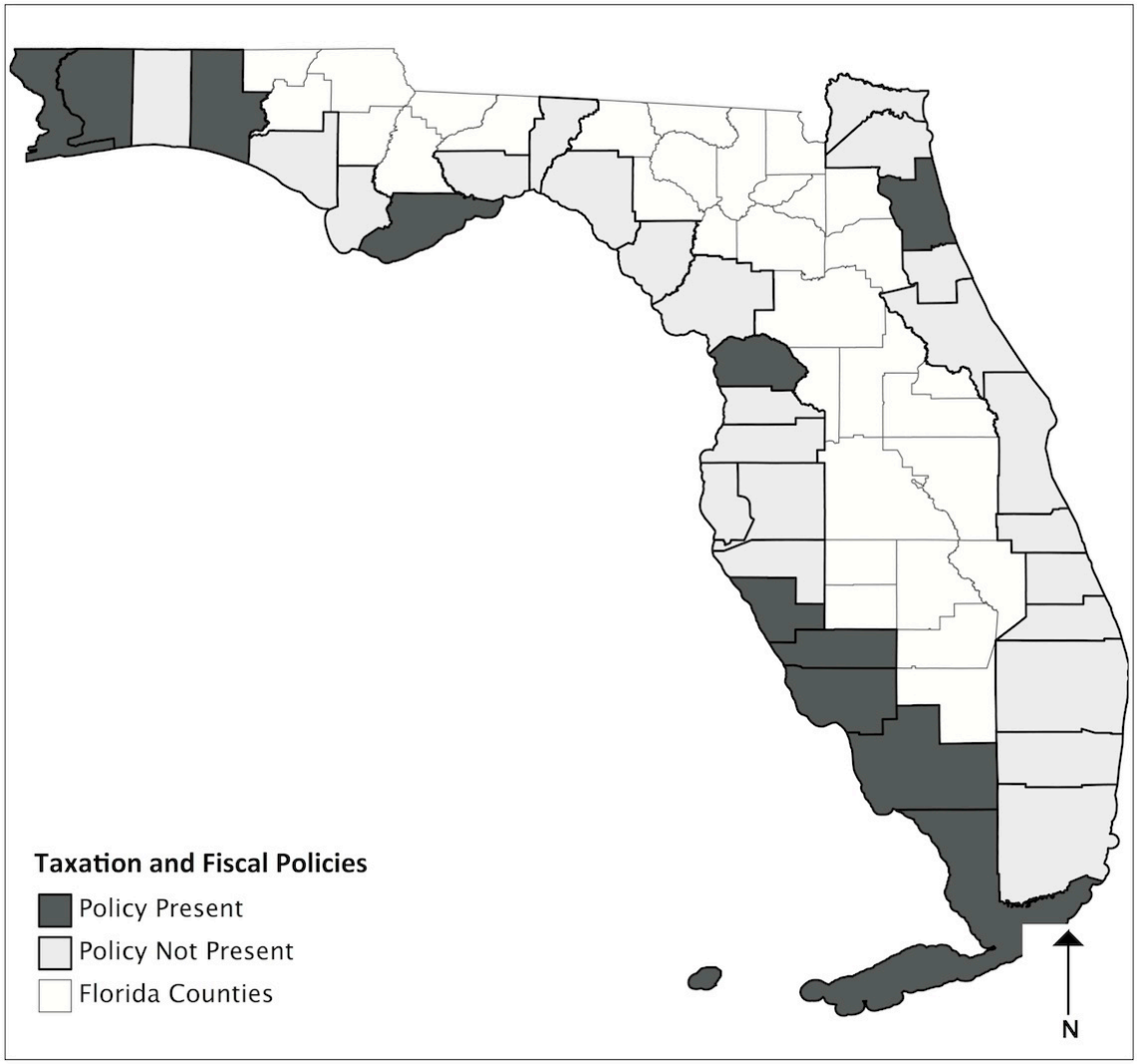

Figure 11. Taxation and Fiscal Policy

Figure 11 shows how the taxation and fiscal policy has been adopted in Florida coastal counties. The map indicates that more than half coastal counties in Florida have not mentioned taxation and fiscal policy in coastal management element. This is the reason why this policy ranked fifteenth among the 18 sub-policies. Jurisdictions that mentioned this policy use impact fee and taxing as mechanisms of helping local governments to fund some plans like evacuation plans for public benefit.

4.3.6 Information Dissemination

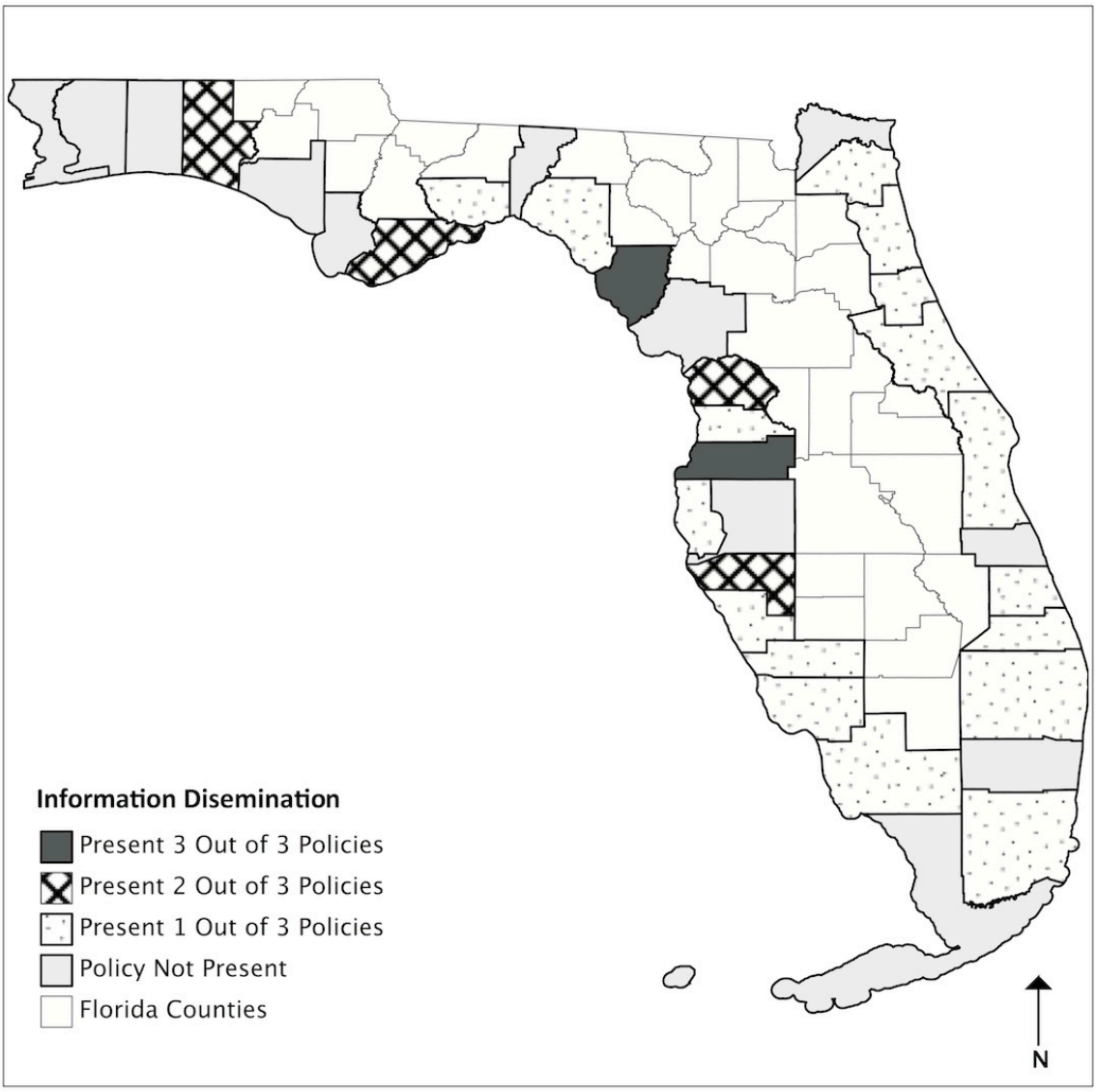

Figure 12. Information Dissemination Policy

Figure 12 shows how the information and dissemination policy has been adopted in Florida coastal counties. The map indicates that most jurisdictions have only adopted one out of the three policies and only two adopted all three out of the three policies. This policy is considered important because the policy aim to give information and educate people about hazard's risk and actions that people should take when a natural hazards occurs. Most education programs mentioned in the coastal management element are

focused more on educating people about waste managements and wildlife animals, and endangered wildlife habitat in the coastal counties. For instance, about manatee and its habitats that should be protected.

When most coastal counties in Florida are exposed to massive natural hazard like hurricanes, it is necessary to have information dissemination to be mentioned in the coastal management element. Even though the existence of this policy does not judge the success of the implementation in each coastal county because the implementations are probably very good but the policy has not been mentioned in the coastal zone management. Concerning the pivotal function of the policy, it will be better for each jurisdiction to have this policy mentioned in coastal management element of the comprehensive plans. The absence of this policy in many jurisdictions' coastal management elements of the comprehensive plans answers the statistic descriptive analysis result that shows information dissemination as the least adopted policy among the six major policies.

4.3.6.1 Sharing Public Information Policy Adoption

Sharing public information policy adoption gets more attention by the jurisdictions compared to the other two policies: hazard disclosure requirement and warning signage in hazardous areas. Ranked eleventh among 18 sub policies, 66% jurisdictions have adopted this policy in the coastal management element.

Even though there are several hazards like hurricanes, flood, dunes degradation and erosion and even the rare earthquake have been listed by FEMA as Florida potential hazards. Hurricanes appear to be the most crucial hazard to be informed to the people. The reason is because Florida have been experienced many hurricanes. But it will be a good suggestion to include other hazards in the information and education program.

4.3.6.2 Hazard Disclosure Requirement Policy Adoption

Hazard disclosure ranked sixteenth among 18 sub-policies. Only six jurisdictions have adopted hazard disclosure requirement policy category. There are two probabilities why this policy placed in the bottom three of the least policies adopted by the jurisdictions. First, because the jurisdictions do not think that it is necessary to mention hazard disclosure requirement because there are other documents that potentially regulate this policy or hazard disclosure might have been implicitly included in the public information as private sectors are counted as public in general. To prove these possibilities, future detail research will be needed.

4.3.6.3 Warning Signage in Hazardous Area Policy Adoption

Warning signage in hazardous area policy is the second least adopted policies by the jurisdictions. Only two counties adopt this policy even though warning signage is very important for hazard like hurricanes. Signages like route of evacuations or area that experience repeated hurricanes event are examples of necessary signage in hazardous area. But only two jurisdictions have mentioned it in the coastal management

element. Even though each county might have already installed enough warning signage at the hazardous sites, incorporating the warning signage policy in the coastal management element will be better than not mention anything about the warning signage policy. Signage policy that has been mentioned in most jurisdictions is mostly the signage regulation of the motor speed to protect manatee habitats and the signage to inform the habitat of manatee.

As a result, manatees seem to get more attention for this policy. Therefore, even though the keyword of "signage" mentioned several times in the coastal management element, many "signage" keyword found in the coastal management element cannot counted as "mentioned".

Chapter 5: Conclusion

5.1 The Development Management Policies Adoption in the Coastal Management Element of Florida Local Comprehensive Plans

Regarding first research question, "To what extent have local comprehensive plans adopted the development management as an instrument of hazard mitigation in the coastal management element?" the research indicates moderate score percentage of most jurisdictions (30 counties) policies adoption range from 26%-75% and 60% of the total jurisdictions (20 counties) adopted 50%-74% of the overall policies. There is gap between counties that adopted the most and the least, but in general most jurisdictions have paid moderate attention to integrating hazard mitigation and coastal management with the comprehensive plan.

The fist finding also answered the second question "Do the local comprehensive plans have all the development management policies in the coastal management element?". Even though, generally, most jurisdictions have shown good efforts, none of them have really incorporated all policies. The adoption of the policies, based on the qualitative analysis, appears to be influenced a lot by the hazard experiences of the counties and the focus of protections. Counties that experience severe or repeated hazards like hurricanes and floods will adopt more policies like zoning regulations, flood proofing, retrofit, building codes and other policies that directly support the effort of disaster mitigation. While other jurisdictions that have special destination area like attractive beaches for tourism or habitat for certain wild animals like

manatee will focus and give more attention to coastal environment protection efforts. The different focuses result in some policies getting more attention and others less, or even not adopted, in the coastal management element.

5.2 Most Adopted Policies in the Coastal Management Element of Comprehensive Plan

The finding of sensitive land protection, relocation effort and siting focal public facilities at hazard free area as the most adopted policies among 18 sub-policies provided on table 7 has answered the third question of this research "Which policies appear to be the most adopted development management policies in the local comprehensive plans". Even though only 6 policies out of 18 sub-policies got attention less that 50% in the coastal management element. These elements need to be considered and added in the element because some of them are critical for hazard mitigation effort but got a really low score.

The result of most adopted policies will give a view to the local government of what they have missed in integrating hazard mitigation with coastal management and comprehensive plan. Some documents clearly explain in the beginning of the coastal management element that most of the content of coastal management are not details because they have been regulated in other elements in the comprehensive plan. This introduction is understandable to avoid overlap content. Therefor some policies will refer to another chapter or guidelines for example long term capital improvement policy will refer to capital improvement element in comprehensive plan or like

building codes or zoning will refer to the building codes guideline book and to see zoning map for more detail information. Some counties use this strategy to integrate hazard mitigation, coastal management and comprehensive plan, some do not really include policies that have been regulated in other elements and very little of the jurisdictions only have couple of pages explaining the overall coastal management policies and strategies they are focusing on.

5.3 Comparison to Previous Research

Similar research about measuring hazard mitigation planning in comprehensive plans at the state and local levels (Berke et all., 2009; Lewis, 2011; Berke et all., 2012a) has focused on measuring the quality of the overall plan: goals, fact base, policies, participation, inter-organizational coordination, implementation, and plan monitoring. Not to repeat previous research, this research has been more precise in evaluating the effort of specific hazard mitigation strategies (development management strategies) as part of the comprehensive plan, and on coastal management, represented by the coastal management element in the local comprehensive plan document.

As a result, instead of giving a general and broad picture of the hazard mitigation plan quality and identifying which principal components have more quality or which have less, this research precisely identifies which sub-policies have been mentioned or included and which policies need more attention and need to be considered. This research also shows how the way of adopting the policies has been varied among jurisdictions and what factors may have influenced this variation. Even though the

level of details of this research, compared to the previous research, is different in both the scope of the elements evaluated and the results, this research will help local and state government in the future to achieve a higher quality of hazard mitigation plan.

5.4 Implications and Recommendations

By measuring the development management strategy policies in the coastal management element of local comprehensive plans, this research gives insight on how to incorporate or integrate hazard mitigation and coastal management in comprehensive plans in Florida and also other states. This research contribution to the hazard mitigation efforts by local government is presented it the following ways. First, a measurable concept of evaluation is suggested with some indicators that can be used (and accordingly adjusted if necessary) to see whether some key policies of specific hazard mitigation strategies have been adopted well in the coastal management element of the comprehensive plan. The measure is reasonably precise and comparable among jurisdictions. Second, the extent to which local jurisdictions are focusing their hazard mitigation's policies is shown by providing the information about which policies have gotten the most attention and which policies have gotten the least attention by the jurisdictions. Thus, the jurisdictions can make some decisions that will lead to more inclusive coastal management elements in the future.

The recommendation from this research is that jurisdictions to pay more attention to the least adopted policies, like incentives to avoid sensitive and hazardous area policy, taxation and fiscal policy, hazard disclosure policy and warning signage in

hazardous areas policies. These policies should be included in the coastal management element. In fact, those policies might be in another element of the comprehensive plan and have been implemented in some areas, but that is not a good reason to not include these policies in the coastal management element. As other policies like sensitive land protection that have been included in a separate element (conservation element), building codes and zoning in the land use element, or long term capital improvement policies that have been included in the capital improvement element, all of those policies are also integrated in the coastal management element. Incentives to avoid sensitive and hazardous area policy, taxation and fiscal policy, hazard disclosure policy and warning signage in hazardous area policies also need to be included in the coastal management element. This is to make sure that the hazard mitigation effort is one of the concerns of coastal management. Having those policies in the coastal management element will require some coastal areas that have not installed the signage, have weak taxation policies or have not provided hazards disclosure to strengthen their weakness and fix the weakness by providing necessary regulations and infrastructures.

At last, since this research gives very clear and detail information and scores for each jurisdiction, it will be a good recommendation to every local jurisdiction to collaborate and coordinate together to improve the quality of their plans and implementation efforts, especially because some of them are on the same coastal lines (gulf of Mexico and Atlantic Ocean) and even share borders.

5.5 Suggestions

Similar research should be conducted on other elements in comprehensive plans to give more information to local governments about their performance in integrating hazard mitigation with comprehensive plans. It looks easy, but it needs strong determination from the jurisdictions. Evaluating documents most of the time is seen as a non-real evaluation, because the real challenge is the implementation. But the plan, as guidelines at the same time, will direct a good implementation. Therefore, the result of this research is aimed to suggest that local jurisdictions improve and re-evaluate their policies adoption. In the future, there is some potential research to extent this research:

1. Find the correlation of the policy adoption rate with jurisdictions population size, hazards experiences, after-hazard reconstruction spending and/or other variable related to hazards.
2. Explore the possibility for inter-governmental coordination for the adoption of hazard mitigation strategies, because the research found that some counties with same adoption rate are sharing administrative and coastal borders (grouped by 2-3 counties) next to each other.
3. Explore the implementation of policies to see the effectiveness of having the coastal management element as an integration of hazard mitigation, coastal management and the comprehensive plan.

5.6 Limitation

As with most other research, this research has some limitations. The primary limitation of this research is the potential of subjectivity or personal bias in deciding the scoring. The writer is aware of this bias potential and therefore limited the coding protocol into only two codes; "1" as "mentioned" to identify the presence of policies and "0" as "not mentioned", which indicates that the policies are not present in the coastal management element. Having more codes would be harder to justify. Since this research has been done by a single coder, personal bias may have influences the score of each plan. Having multiple coders or evaluators might have reduced the bias potential, but that was not possible for this research.

The result of this research is not to measure the quality of the local coastal counties' comprehensive plans in Florida. The total plan quality formula was use as a tool to measure the adoption of development management policies in the coastal management element, just one element in local comprehensive plans, that has been mandated by the government of Florida as part of the minimum requirements of comprehensive plans. The higher quality measures from the result, indicates the "more adoption" and "more attention" of the jurisdiction in integrating the disaster mitigation effort into coastal management and comprehensive plan.

The coastal management element in the comprehensive plan is a crosscutting of coastal management, the comprehensive plan and disaster mitigation. Planning for the protection of coastal areas from degradation and risk of hazards, especially coastal

hazards, is a big challenge. The content of coastal management element policies involve the integration of other element policies like land use, infrastructure, housing, conservation and the other elements in the comprehensive plan. This integration requires great efforts to maintain and manage the overall quality of coastal zone environment including restoration, enhancement and maintenance and also addressing the potential hazards and the mitigation strategy. Therefore, this research has been conducted to evaluate if this integration is effective enough in the comprehensive plan in supporting the development management strategy as an instrument of disaster mitigation.

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Appendix 1: Coding Table

No	County Names	Building Standard and Construction Detail				Development Regulation				Critical and Public Facilities			Land and Property Acquisition			Taxation and Fiscal Policies	Information Dissemination		
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(1)	(2)	(3)
1	Escambia	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0
2	Santa Rosa	1	0	0	0	1	0	1	1	1	1	0	1	1	1	1	0	0	0
3	Okaloosa	1	1	0	0	1	1	1	1	0	1	0	1	1	1	0	0	0	0
4	Walton	1	1	0	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0
5	Bay	0	0	0	1	0	1	0	1	1	1	0	1	1	1	0	0	0	0
6	Gulf	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0
7	Franklin	1	1	0	1	0	0	0	1	0	1	0	0	0	0	1	1	1	0
8	Wakulla	0	1	0	1	0	1	0	1	1	1	0	0	1	0	0	1	0	0
9	Jefferson	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
10	Taylor	0	1	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	0
11	Dixie	0	1	0	1	0	0	0	1	1	1	0	0	0	1	0	1	1	0
12	Levy	1	1	0	0	1	1	1	1	1	0	0	1	1	1	0	0	0	0
13	Citrus	1	0	0	0	0	0	1	1	1	1	0	1	0	1	1	1	1	0
14	Hernando	1	0	0	1	1	1	0	1	1	1	0	1	1	1	0	1	0	0
15	Pasco	1	1	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	1
16	Pinellas	1	0	0	0	1	1	0	1	1	1	0	0	0	1	0	1	0	0
17	Hillsborough	0	1	0	1	1	0	1	1	1	1	0	0	0	1	0	0	0	0
18	Manatee	0	0	0	1	1	0	1	1	0	1	0	1	1	1	0	1	1	0
19	Sarasota	1	0	0	1	1	1	1	1	0	1	1	0	0	1	1	1	0	0
20	Charlotte	1	1	0	1	0	1	0	1	0	1	1	1	1	1	1	1	0	0
21	Lee	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0

22	**Collier**	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0
23	**Monroe**	1	1	0	1	0	1	1	1	1	0	1	1	1	1	1	0	0	0
24	**Miami-Dade**	1	1	0	1	0	1	0	1	0	1	0	1	1	1	0	1	0	0
25	**Broward**	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
26	**Palm Beach**	1	1	0	1	1	0	1	1	1	0	1	1	1	1	0	1	0	0
27	**Martin**	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	1	0	0
28	**St. Lucie**	1	1	0	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0
29	**Indian River**	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0	0	0
30	**Brevard**	1	0	0	1	1	0	1	1	0	1	1	1	1	1	0	1	0	0
31	**Volusia**	1	1	0	1	1	1	0	1	1	1	1	1	1	1	0	1	0	0
32	**Flagler**	1	1	0	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0
33	**St. Johns**	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0
34	**Duval**	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0
35	**Nassau**	1	1	0	1	0	1	1	1	1	1	1	1	1	1	0	0	0	0

Appendix 2: Major Policies Score and Policies Adoption

Building Standard and Construction Detail			Development Regulation			Critical and Public Facilities		
County Names	**%**	**Presence**	**County Names**	**%**	**Presence**	**County Names**	**%**	**Presence**
Jefferson	0%	Not Present	Dixie	25%	Present 1 Out of 4 Policies	Broward	0%	Not Present
Indian River	0%		Franklin	25%		Indian River	0%	
Bay	25%	Present 1 Out of 4 Policies	Jefferson	25%		Jefferson	0%	
Broward	25%		Taylor	25%		Franklin	33%	Present 1 Out of 3 Policies
Citrus	25%		Bay	50%	Present 2 Out of 4 Policies	Levy	33%	
Manatee	25%		Broward	50%		Manatee	33%	
Pinellas	25%		Charlotte	50%		Miami-Dade	33%	
Santa Rosa	25%		Citrus	50%		Okaloosa	33%	
St. Johns	25%		Indian River	50%		Taylor	33%	
Brevard	50%	Present 2 Out of 4 Policies	Miami-Dade	50%		Bay	67%	Present 2 Out of 3 Policies
Dixie	50%		Pasco	50%		Brevard	67%	
Gulf	50%		Wakulla	50%		Charlotte	67%	
Hernando	50%		Brevard	75%	Present 3 Out of 4 Policies	Citrus	67%	
Hillsborough	50%		Gulf	75%		Dixie	67%	
Lee	50%		Hernando	75%		Flagler	67%	
Levy	50%		Hillsborough	75%		Gulf	67%	
Okaloosa	50%		Manatee	75%		Hernando	67%	
Sarasota	50%		Martin	75%		Hillsborough	67%	
Taylor	50%		Monroe	75%		Monroe	67%	
Wakulla	50%		Nassau	75%		Palm Beach	67%	
Charlotte	75%	Present 3 Out of 4 Policies	Palm Beach	75%		Pinellas	67%	
Collier	75%		Pinellas	75%		Santa Rosa	67%	
Duval (*)	75%		Santa Rosa	75%		Sarasota	67%	

Escambia	75%		St. Johns	75%		St. Lucie	67%	
Flagler	75%		Volusia	75%		Wakulla	67%	
Franklin	75%		Collier	100%		Walton	67%	
Martin	75%		Duval (*)	100%		Collier	100%	
Miami-Dade	75%		Escambia	100%		Duval (*)	100%	
Monroe	75%		Flagler	100%		Escambia	100%	
Nassau	75%		Lee	100%	Present 4 Out of 4 Policies	Lee	100%	
Palm Beach	75%		Levy	100%		Martin	100%	Present 3 Out of 3 Policies
Pasco	75%		Okaloosa	100%		Nassau	100%	
St. Lucie	75%		Sarasota	100%		Pasco	100%	
Volusia	75%		St. Lucie	100%		St. Johns	100%	
Walton	75%		Walton	100%		Volusia	100%	

Land and Property Acquisition			Taxation and Fiscal Policies			Information Dissemination		
County Names	**%**	**Presence**	**County Names**	**%**	**Presence**	**County Names**	**%**	**Presence**
Broward	0%	Not Present	Bay	0%	Present	Bay	0%	Not Present
Franklin	0%		Brevard	0%		Broward	0%	
Gulf	0%		Broward	0%		Escambia	0%	
Jefferson	0%		Dixie	0%		Gulf	0%	
Dixie	33%	Present 1 Out of 3 Policies	Duval (*)	0%		Hillsborough	0%	
Hillsborough	33%		Flagler	0%		Indian River	0%	
Pinellas	33%		Gulf	0%		Jefferson	0%	
Sarasota	33%		Hernando	0%		Levy	0%	
Taylor	33%		Hillsborough	0%		Monroe	0%	
Wakulla	33%		Indian River	0%		Nassau	0%	
Walton	33%		Jefferson	0%		Okaloosa	0%	
Citrus	67%	Present 2 Out of 3 Policies	Levy	0%		Santa Rosa	0%	
Collier	67%		Manatee	0%		Brevard	33%	Present 1 Out of 3 Policies
Escambia	67%		Martin	0%		Charlotte	33%	
Bay	100%	Present 3 Out of 3 Policies	Miami-Dade	0%		Collier	33%	
Brevard	100%		Nassau	0%		Duval (*)	33%	
Charlotte	100%		Okaloosa	0%		Flagler	33%	
Duval (*)	100%		Palm Beach	0%		Hernando	33%	
Flagler	100%		Pasco	0%		Lee	33%	
Hernando	100%		Pinellas	0%		Martin	33%	
Indian River	100%		St. Lucie	0%		Miami-Dade	33%	
Lee	100%		Taylor	0%		Palm Beach	33%	
Levy	100%		Volusia	0%		Pinellas	33%	
Manatee	100%		Wakulla	0%		Sarasota	33%	

Martin	100%		Charlotte	100%		St. Johns	33%	
Miami-Dade	100%		Citrus	100%		St. Lucie	33%	
Monroe	100%		Collier	100%		Taylor	33%	
Nassau	100%		Escambia	100%		Volusia	33%	
Okaloosa	100%		Franklin	100%		Wakulla	33%	
Palm Beach	100%		Lee	100%	Not Present	Citrus	67%	Present 2 Out of 3 Policies
Pasco	100%		Monroe	100%		Franklin	67%	
Santa Rosa	100%		Santa Rosa	100%		Manatee	67%	
St. Johns	100%		Sarasota	100%		Walton	67%	
St. Lucie	100%		St. Johns	100%		Dixie	100%	Present 3 Out of 3 Policies
Volusia	100%		Walton	100%		Pasco	100%	

Appendix 3: Plans By County and Document Download Link

Code	County Names	Plan Year	Tittle	Source
FL-01	Escambia	2013	Escambia County Comprehensive Plan 2030	http://myescambia.com/sites/myescambia.com/files/pages/2012/Oct/Comprehensive%20Plan%20and%20Land%20Development%20Code/2030Comp%20Plan_6_2013.pdf
FL-02	Santa Rosa	2008	Santa Rosa county comprehensive Plan: 2008 - 2025	http://www.santarosa.fl.gov/developmentservices/documents/2008-2025%20Comp%20Plan.pdf
FL-03	Okaloosa	2009	Okaloosa County 2020 Comprehensive Plan	http://www.co.okaloosa.fl.us/dept_growth_mgmt_comp_plans.html
FL-04	Walton	2010	Walton County Comprehensive Plan	http://fl-waltoncounty2.civicplus.com/index.aspx?nid=68
FL-07	Bay	2010	Bay County Florida Comprehensive Plan	https://papers.deo.myflorida.com/FloridaPapers/FlashAug16/frames.cfm
FL-09	Gulf	2011	Gulf County Comprehensive Plan Revision	http://www.gulfcounty-fl.gov/pdf/141283011021432.pdf
FL-11	Franklin	N.A	Franklin County Comprehensive Plan	http://www.franklincountyflorida.com/documents/planning_building/ComprehensivePlan.pdf
FL-12	Wakulla	2013	Wakulla County Comprehensive Plan	http://www.mywakulla.com/departments/planning_and_zoning/document_center.php#revize_document_center_rz1019
FL-14	Jefferson	2011	Comprehensive Plan 2025 Jefferson County Florida	http://www.jeffersoncountyfl.gov/Uploads/Editor/file/planning/!!2011_FINAL_CP-FLUM_AMEND-Rev-08-23-11.pdf
FL-15	Taylor	N.A	Taylor County Comprehensive Plan	http://www.taylorcountygov.com/gm/Chapters.htm
FL-18	Dixie	2009	Dixie County Comprehensive Plan	http://dixie.fl.gov/pdf_building/2011cp.pdf
FL-20	Levy	N.A	Levy county Comprehensive Plan	http://www.levycounty.org/comprehensiveplan.aspx
FL-22	Citrus	1998	Citrus County Comprehensive Plan 1995-2020	http://myfwc.com/media/415124/Manatee_CitrusMPP97.pdf
FL-24	Hernando	2013	Comprehensive Plan Hernando County, Florida	http://www.hernandocounty.us/plan/PlanningCompPlan.htm

FL-25	Pasco	2013	2025 Comprehensive Plan Pasco county, Florida	http://www.pascocountyfl.net/index.aspx?NID=1807
FL-26	Pinellas	2008	Pinellas County Comprehensive Plan	http://www.pinellascounty.org/plan/comprehensive_plan.htm
FL-27	Hillsborough	2008	Hillsborough Comprehensive Plan	http://www.planhillsborough.org/hillsborough-county-comprehensive-plan/
FL-28	Manatee	N.A	Manatee County Comprehensive Plan	http://www.mymanatee.org/home/government/departments/building-and-development-services/planning-zoning/comprehensive-planning-section/comprehensive-plan.html#jump1
FL-30	Sarasota	2002	Saratosa County Comprehensive Plan	https://www.scgov.net/CompPlan/Pages/default.aspx
FL-32	Charlotte	2010	Charlotte 2050 Comprehensive Plan	http://www.smartcharlotte2050.com/
FL-34	Lee	2013	The Lee pLan 2013 Condification	http://www.leegov.com/gov/dept/dcd/Planning/Documents/LeePlan/Leeplan.pdf
FL-36	Collier	2002	Collier County Growth Management Plan and	http://www.colliergov.net/modules/showdocument.aspx?documentid=51614
FL-37	Monroe	2010	Monroe County Year 2010 Comprehensive Plan	http://fl-monroecounty.civicplus.com/DocumentCenter/Home/View/4606
FL-38	Miami-Dade	2009	Miami-Dade Comprehensive development Master Plan	http://www.miamidade.gov/planning/cdmp-adopted.asp
FL-39	Broward	2012	Broward County Comprehensive Plan	http://www.broward.org/PlanningAndRedevelopment/ComprehensivePlanning/Pages/CompPlan.aspx
FL-40	Palm Beach	2013	Palb Beach County Comprehensive Plan	http://www.co.palm-beach.fl.us/pzb/planning/comprehensiveplan/tableofcontent.htm
FL-41	Martin	2009	Comprehensive Growth Management Plan County of Martin, Florida	http://library.municode.com/index.aspx?clientId=13591
FL-43	St. Lucie	2010	St. Lucie Comprehensive Plan	http://www.stlucieco.gov/planning/comp_plan.htm
FL-44	Indian River	2010	Indian River County 2030 Comprehensive Plan	http://www.irccdd.com/Planning_Division/Comp_Plan.htm
FL-46	Brevard	2013	Brevard County Comprehensive Plan	http://www.brevardcounty.us/PlanningDev/CompPlan

FL-50	Volusia	2007	Volusia County Comprehensive Plan	http://www.volusiatpo.org/wp-content/uploads/CIPComPlansetc8-11/Daytona%20Beach_compplan.pdf
FL-52	Flagler	2010	Flagler County Comprehensive Plan 2010-2035	http://www.flaglercounty.org/index.aspx?nid=689
FL-54	St. Johns	2010	St. John County 2025 Comprehensive Plan	http://www.co.st-johns.fl.us/LongRangePlanning/media/CPA2025/2Adopted2025.pdf
FL-56	Duval	2009	2030 Comprehensive Plan	https://papers.deo.myflorida.com/FloridaPapers/FlashAug16/frames.cfm
FL-57	Nassau	2010	Nassau County Florida 2010-2030 Comprehensive Plan	http://www.nassaucountyfl.com/DocumentCenter/Home/View/4913

Writer Resume

PESONAL INFORMATION

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EDUCATION

- Major : Community and Regional Planning
  University : University of Nebraska Lincoln (UNL)
  GPA : 3.76 / 4.0
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  Thesis : Measuring The Adoption Of Development Management Policies As An Instrument Of Disaster Mitigation Toward Resilience Coastal Community In Florida

- Major : Urban and Regional Planning
  University : Institut Teknologi Sepuluh Nopember (ITS)
  GPA : 3.45 / 4.0
  Graduation Year : 2010
  Honors Thesis : Space Used Control Guidelines as an Instrument of Mitigation for Tsunami Vulnerable Area at Lampulo Fisherman Village in Banda Aceh

ADDITIONAL RELEVANT ACADEMIC QUALIFICATIONS

- Program : Summer School (2007)
  University : Technische Universität Berlin (TU-Berlin), Germany
  Subject : Techniques and Technology for Sustainability

- Program : Summer Lecture Exchange (2009)
  University : Kobe University (KU), Japan
  Subject : Disaster Management and Countermeasures

EXPERIENCE

2012 Volunteer Quran and Art Teacher at Sabah Foundation, Lincoln Nebraska
2010 Institute for Research and Community Service of Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia. Planner of Mimika Papua Regional Comprehensive Plan (2011-2031)
2009 Institute for Research and Community Service of Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia. Intern Planner Worked on asset Management of East Java Region Project
2008 Urban and Regional Planning Department of Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia. Teaching Assistant for Urban Economic Subject

COMPUTER SKILLS

Operating System : Windows and Macintosh
Software : Microsoft Office, Arc View, Arc GIS, Cartographica, Auto Cad, Sketch up, Photoshop, Corel Draw, SPSS,

ORGANIZATIONAL EXPERIENCE

2012-2013 President of Intercultural Dialogue Group (IDG) of UNL
2012-2013 Treasure of Student Planning Association of Nebraska (SPAN)
2011-2013 Student Member of American Planning Association (APA)
2011-2013 Board Member and Member of UNL Muslim Student Association (MSA)
2011–Present Founder and Member of Aceh Planner Community
2008-Present Member and Country Correspondence of World Architecture Community
2008-Present Member of Indonesia Urban and Regional Planning Student Association
2007-Present Member of Urban and Rural Development Network (URDN)
2007-Present DAAD German Alumni

HONORS AND AWARDS

2012 College of Architecture, Dana & DLR Academic Achievement Scholarship
2011 Aceh Government, USA Graduate Scholarship
2010 Selected student as Key Note speaker on International Conference CRISSU and CUPT V, Chiang Mai-Thailand
2010 Leadership training "Young Leader for Indonesia" McKinsey Indonesia grant
2010 National Best Social Entrepreneurship Initiative (SEI) – 1st Prize
2010 National Student Creativity Competition (Community service innovation) PKM - Gold Medal
2010 ITS Outstanding Student (University best student competition) – 1st Prize
2009 Photograph festival on 2nd PLANOPOLIS 2K9 – 3rd Prize
2009 Kobe University International Lecture Exchange Program, JASSO grant
2009 Academic Potential Achievement Scholarship from ITS
2008 National Student Scientific Writing Competition - 1st Prize
2007 TU-Berlin International Student Writing Competition - 1st Prize
2007 TU-Berlin International Summer School "Techniques and Technology for Sustainability" by DAAD, TU Berlin and URDN