How can planners and managers foster resilient communities in the face of flooding and storm events that become more frequent and severe due to climate change and sea level rise? It is beneficial to learn from innovative projects that tackle this issue and to become familiar with the resources and tools available. The third and final in a series of three, this Info Pack contains case studies, reports, and other useful resources that aim to inform readers of best practices and tools that support the responsible use of land in the midst of a rapidly changing climate.

**Case Studies & Success Stories**

**Four Essential Virtues in a Post-Disaster World** APA Recovery News Jan. 2013

APA provides a first-hand account of how a riverfront master plan for Cedar Rapids, Iowa, suddenly became a disaster recovery plan after a devastating flood in 2008. The recovery plan helped the town achieve a “new normal” by raising standards for buildings and neighborhoods.

**Delaware: Buyer-beware Option Considered on Sea Level Rise** The Daily Times Jan. 2013

Superstorm Sandy instigated several community- and regional-scale conversations about land use and sea level rise, including this emerging debate in Delaware surrounding sea level rise disclosures.

**We’re In This Together: What the Dutch Know About Flooding That We Don’t** The Atlantic Cities Jan. 2013

The Dutch, whose entire country has been at risk of devastating flooding for centuries, have developed a communal mindset where the question isn’t who should build flood protection infrastructure but how various stakeholders can get involved.


Cities like Rotterdam and Singapore have instituted innovative strategies to adapt to frequent flooding by working to accommodate, rather than repel the rising tides. Both cities utilize infrastructural and social approaches to “climate-proof” their communities.


Though revised government construction guidelines have been slow to take effect, some builders in the New York area are already taking extra precautions to protect their projects from flooding.


While funding for recommended policies and infrastructure safeguards is controversial in a tight economy, Sandy demonstrated that the cost of not taking adequate precautions will be even greater.


Cedar Falls has developed a variety of successful mitigation and prevention strategies, including updated floodplain maps and reinforced storm water systems that can serve as models for other low-lying cities.

Vail After the Low-Snow Winter  Urban Land Oct. 2012

In its own way, Vail, Colorado, has charted its course towards sustainability by creating an identity independent of skiing and heavy snowfall. A recent winter drought was evidence that ski resorts must learn to accommodate the increasingly volatile weather patterns associated with climate change.

BP Gets Resilient in Houston  Urban Land Jul. 2012

BP has transformed its massive Houston facility into a flooding and blackout-proof fortress, serving as a model for how large projects can retroactively take precautions if they are in a flood-prone area.


One architect argues that by implementing diversity in a building’s infrastructure, it can withstand and adapt to the consequences of climate change while retaining an approachable, human aesthetic.

Resilient Coastal City Regions: Planning for Climate Change in the United State and Australia  Urban Land Jun. 2012

Congressional gridlock is providing individual states and cities with little federal funding for climate initiatives. States like California have enacted strong climate change bills to protect its vulnerable coastline, while the southeastern part of the country has yet to implement any sort of regional initiative.


While New York and New Orleans are preparing for too much water, the Southwest is implementing strategies to conserve water in the face of potential drought and diminishing snowmelt.


Augusta, Georgia, has taken the initiative to break the “build-flood-rebuild cycle” afflicting hundreds of other American cities.
Cities Lead the Way in Climate-Change Action Nature Oct. 2010

Climate change research and funding tend to be directed at entire nations; however city governments have proven significantly more effective at implementing the findings and recommendations of experts.

Adaptation Costs of Climate Change Risks Urban Land Aug. 2010

Real estate investment analysis models often fail to account for medium and long term effects of climate change. However, the expectation of government-mandated adaptation measures is in itself raising investment costs that would inevitably be raised by long term climate change anyway.


Europe has been leading the way in controlling the movement of floodwaters by realigning their levees and dikes to strategic locations, steering the flow of water away from towns and farmland.

Strategies for Managing Sea Level Rise Urbanist Nov. 2009

SPUR created this accessible guide to seven flood prevention strategies with several examples of each and a list of potential advantages and disadvantages.

Regional Assessments & Policy Briefs

Coastal Management in the Face of Rising Seas: Legal Strategies for Connecticut Sea Grant Law and Policy Journal 2012

The Georgetown Climate Center examines local- and state-level adaptation approaches for implementing successful coastal adaptation policy in Connecticut amidst a siloed regulatory framework.

The Relocation of Development from Coastal Hazards through Publicly Funded Acquisition Programs: Examples and Lessons from the Gulf Coast Sea Grant Law and Policy Journal 2012

Using acquisition programs in Louisiana and Mississippi as a starting point, this policy brief analyzes the planning process behind relocating development away from areas vulnerable to sea level rise.

A Model Sea-Level Rise Overlay Zone for Maryland Local Governments Georgetown Climate Center Nov. 2011

The Georgetown Climate Center provides a model ordinance to strengthen resilience against flooding in Maryland, accompanied by policy considerations and a roadmap for implementation.

Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline San Francisco Bay Conservation and Development Commission Oct. 2011

The planning, governance, and policy recommendations for the San Francisco Bay presented in this report are based on two sea level rise projections conducted by the BCDC.
Virginia Case Study—Stemming the Tide: How Local Governments Can Manage Rising Flood Risks
Georgetown Climate Center May 2010

Through analysis of Virginia local governments’ existing land use powers, the Georgetown Climate Center determines to what extent these governments can successfully implement the policy options in Virginia’s Climate Action Plan.

Roadmap for Restoring Ecosystem Resiliency and Sustainability Louisiana-Mississippi Gulf Coast Ecosystem Restoration Working Group Mar. 2010

In order to prevent against further wetland loss and barrier island erosion on the Gulf Coast, Georgetown Climate Center developed this strategic policy roadmap to guide the region to safer shores.


Through an intricate understanding of Florida policy, this assessment outlines how to work within an existing framework to build resilience to sea level rise in the state.


Following a devastating flood in Cedar Rapids in 2008, a ULI Advisory Services Panel conducted an assessment of a downtown parcel and submitted recommendations to not only restore the area but make it stronger and more vibrant in its recovery.

ULI Advisory Services Panel Report: Galveston, Texas ULI May 2009

This ULI Advisory Services Panel Report provides strategies for sustainable neighborhood development in Galveston, Texas, following Hurricane Ike in 2008. The report recommends focusing development in the historic urban core while respecting the island’s fragile ecosystem.

The Hub Concept: Infrastructure for a Community Disaster Response SPUR Oct. 2008

Although directed towards earthquake recovery, the Hub Concept for San Francisco can resonate in other communities facing risk to natural hazards. The Hub calls for coordination of information and resources in an emergency event via an innovative, pre-planned framework.

ULI Advisory Services Panel Report: Bayou LaBatre, Alabama ULI 2006

By strategically identifying redevelopment opportunities in areas damaged by Hurricane Katrina, this ULI Advisory Services Panel Report aimed to help a local government set priorities in its recovery efforts.

ULI Advisory Services Panel Report: New Orleans, Louisiana ULI Nov. 2005

This high-profile ULI Advisory Services Panel Report developed an overall framework for New Orleans city leaders to generate detailed plans for rebuilding following Hurricane Katrina.
Regional Plans


Governor Cuomo’s NYS 2100 Commission recently released this draft to their final report on post-Sandy efforts. The study emphasizes soft infrastructure improvements, transportation investment, and broadened insurance coverage among other long-term goals.

**Adapting to Climate Change in the Ocean State: A Starting Point** Rhode Island Climate Change Commission Nov. 2012

A Rhode Island Commission developed this set of recommendations to coordinate adaptation planning and facilitate the mainstreaming of policies to better prepare their vulnerable state for climate change.

**A Region Responds to a Changing Climate: Southeast Florida Regional Climate Change Compact Counties Regional Climate Action Plan** Southeast Florida Regional Compact on Climate Change Oct. 2012

The Southeastern tip of the U.S. is one of the most exposed regions to the physical impacts of climate change. An ongoing working group produced this report to explain their progress thus far and release a new set of recommendations and next steps for their region at risk.

**Ocean Beach Master Plan** SPUR May 2012

The result of an 18-month public process, this 40-year master plan for Ocean Beach, California, focuses not only on physical resiliency to climate change but also ecological and societal sustainability.

**Adapting to Sea Level Rise: A Guide for California’s Coastal Communities** University of California Santa Cruz Jan. 2012

As a guidebook for local managers, this document walks community leaders through the implementation of vulnerability assessments and risk analyses in their respective zones along the California coast.

**Louisiana’s Comprehensive Master Plan for a Sustainable Coast** Coastal Protection & Restoration Authority 2012

This report not only contains the 2012 Coastal Master Plan for the Louisiana coast, but it also outlines how the plan was developed and how target areas were identified.

**PlaNYC: A Greener, Greater New York** Apr. 2011

The famous PlaNYC spearheaded by Mayor Bloomberg has guided planning and development efforts in New York City since 2007 and reemerged in the spotlight following Superstorm Sandy.

**Broward County Climate Change Action Plan: Addressing our Changing Climate** May 2010

A strong example of a local-level strategy, the Broward County Action Plan contains 126 specific recommendations that achieve a level of detail only possible at such a small scale.
Adapting to Shoreline Change: A Foundation for Improved Management and Planning in South Carolina
Shoreline Change Advisory Committee Apr. 2010

This comprehensive report identifies goals for improved shoreline management in South Carolina and reaffirms the overarching policies of the SC Beachfront Management Act.

Annual Report and Supplemental Recommendations Miami-Dade County Climate Change Advisory Task Force Apr. 2010

A Miami-Dade County Task Force developed 22 recommendations for their county to adapt to the implications of climate change, focusing on smart growth, conservation, and mapping technologies to monitor sea level and infrastructure.

Adaptation Strategies to Protect Areas of Increased Risk From Coastal Flooding Due to Climate Change Rockingham Planning Commission Jul. 2009

After mapping a coastal community in New Hampshire in detail, the Planning Commission developed a series of policy options, zoning changes, and other mitigation and emergency management recommendations for the town.

Chicago Climate Action Plan Sep. 2008

Although not a coastal city, Chicago has developed one of the nation’s leading climate action plans. The plan takes a proactive approach by targeting greenhouse gas emissions and identifying achievable goals at the municipal level.


As a part of a concerted effort to protect Maryland from sea level rise and coastal storms, the Working Group focuses on all aspects of community resiliency and develops an “Adaptation and Response Toolbox” to equip state and local governments in the face of climate change.

West Coast Governors’ Agreement on Ocean Health Action Plan The Office of the Governors of Washington, Oregon, and California May 2008

This unique alliance of West Coast Governors creates a unified approach towards addressing coastal risk and ocean health on the shores of Washington, Oregon, and California.

Protecting Florida’s Communities: Land Use Planning Strategies and Best Development Practices for Minimizing Vulnerability to Flooding and Coastal Zones Florida Department of Community Affairs Sep. 2005

One in a series of best practices publications, this report outlines planning policies and strategies for Florida communities pre- and post-disaster, with the goal of reducing exposure and recovering faster.
Guiding Reports

Global Risks 2013 World Economic Forum 2013

Based on input from over 1,000 experts, this report contains case studies, examples, and data aimed to help orient and inform decision-makers in an increasingly complex and global risk environment.


Through case studies and analysis, TNC outlines how planners can utilize the capacity of natural systems to create more resilient shorelines before resorting to costly hard infrastructure.


The technical supplement to the 2013 National Climate Assessment, conducted under the U.S. Global Change Research Program, outlines the current state of climate risks to the U.S. and identifies the progress and challenges of planning and implementing adaptation options.


By considering the often overlapping goals of smart growth principles, quality of life issues, and coastal resiliency, this report aims to streamline the creation of healthy communities along the shores of the U.S.

Restore-Adapt-Mitigate: Responding to Climate Change Through Coastal Habitat Restoration Restore America’s Estuaries 2012

Serving as a go-to guide for those wisely considering coastal habitat restoration as a means to strengthen the coastline, this report from a reputable non-profit can inform planners, ecologists, communities, and governments who aim to restore their shores.


An invaluable resource for government agencies at any level, this Tool Kit helps decision-makers work within their respective policy frameworks to best prepare their communities for sea level rise.


Emerging out of a 2011 summit, this report outlines recommendations to the U.S. government coming from national hazard and building experts for increasing national resiliency.


Buildings that meet or exceed FEMA regulations tend to survive flooding and storms the least scathed. Become familiar with the agency’s Home Builder’s Guide as a tool for building resilient communities.
Economics of Coastal Zone Adaptation to Climate Change  The World Bank Oct. 2010

The World Bank takes a global look at climate change adaptation, analyzing the costs of hard and soft infrastructure upgrades under four scenarios of global sea level rise.

Hazard Mitigation: Integrating Best Practices into Planning  APA May 2010

Created for those in the planning profession, this APA report provides guidelines and case studies at varying scales that illustrate best practices of planning for the impacts of climate change.

2010 Sustainability Report  Prudential Real Estate Investors 2010

An important example of the private sector addressing climate change, Prudential’s report takes a proactive approach to make sustainability a ubiquitous quality throughout their practice.


Addressing a call from local governments, NOAA walks decision-makers through the process of implementing and maintaining an effective adaptation strategy.

Adapting to Coastal Climate Change: A Guidebook for Development Planners  USAID May 2009

Prepared under the Water Team and Global Climate Change Team of the U.S. Agency for International Development, this guidebook serves as both a tool and resource guide for coastal development planners.

Resilient Coasts: A Blueprint for Action  Ceres/The Heinz Center 2009

Advocating for collective action in the face of rising seas and severe storms, this report emphasizes the commonsense and cost-effective aspects of climate change adaptation in regards to land use.


This living document addresses the challenge of sustainably managing urban flood risk around the world and is meant to serve as a starting point for the development of integrated plans to manage said risk.


By walking through the steps of developing a comprehensive climate adaptation plan for all levels of government, this guidebook sets the pace for successful local and regional strategies for improving resiliency.

Ten Principles for Coastal Development  ULI 2007

During the creation of its Ten Principles, ULI addressed both the threats to the coast as well as the continued desire to occupy the waterfront. The principles aim to work with the natural environment to protect habitat while preserving open space and maintaining access along the waterfront.
**Best Practices Resources**

[Mitigation Best Practices: Public and Private Sector Best Practice Stories for All Activity/Project Types in All States and Territories Relating to All Hazards](#) FEMA Jan. 2013

This recent compilation of FEMA case studies can serve as a resource for planners and governments dealing with any and all types of natural hazards. The case studies included represent a comprehensive database of mitigation best practices pertaining to sea level rise, coastal storms, and other hazards.

**Climate Adaptation & Resilience: A Resource Guide for Local Leaders Version 2.0** Institute for Sustainable Communities 2012

**Promising Practices in Adaptation & Resilience: A Resource Guide for Local Leaders Version 1.0** Institute for Sustainable Communities 2010

These two sources from the ISC are superb resources for someone exploring adaptation options. The guides are rich with case studies, resources, and tools to help planners understand what is already available in the field of climate change adaptation and resilience.

[Local Strategies for Addressing Climate Change: Volume Two](#) NOAA Coastal Services Center Jun. 2010

NOAA created this compilation of adaptation case studies so land use planners and local governments can build on the successes of other projects and regions when grappling with the challenges of improving resiliency.

**APA Recovery News**

Begun in April 2011, APA’s Recovery News blog is an excellent way to keep up with disaster recovery planning efforts occurring around the U.S.

**FEMA Mitigation Best Practices Search**

FEMA’s searchable database of hazard mitigation best practices can be a useful resource for those looking to see what progress has been made in developing adaptation strategies for particular regions or environments.

[Georgetown Climate Center Adaptation Clearinghouse](#)

This searchable database provides a wealth of information on policy strategies and recommendations that intelligently address climate change. The database contains resources on sea level rise, urban heat, and law and governance issues.

**Dutch Dialogues**

This series of workshops connects Dutch innovators in coastal protection to their counterparts in Louisiana, providing a unique, cross-cultural resource for the Gulf Coast and other vulnerable regions around the world.
Tools

CRiSTAL

For planners and managers working at the community level, Community-based Risk Screening Tool for Adaptation and Livelihoods (CRiSTAL) is an Excel-based tool that allows users to understand the impacts to human livelihood in areas vulnerable to climate change.

Halcrow CoastRanger

Halcrow, a CH2M Hill Company, developed CoastRanger as an educational software tool in which users explore the effects of different coastal management approaches in a virtual environment.

ICLEI ADAPT

Local Governments for Sustainability USA developed the Adaptation Database and Planning Tool (ADAPT) to guide local governments through the organization’s Five Milestones for Climate Adaptation.

NOAA Digital Coast: Coastal Inundation Toolkit

A part of the efforts of NOAA’s Digital Coast partnership, the Coastal Inundation Toolkit is an interactive web-based resource that provides tools to better understand and address coastal inundation issues.

NOAA Sea Level Rise and Coastal Flooding Impacts Viewer

The purpose of this data viewer is to provide coastal managers and scientists with a preliminary look at sea level rise and coastal flooding impacts. Data and maps provided can be used at several scales to help gauge trends and prioritize actions for different scenarios.

NOAA Coastal Change Analysis Program (C-CAP) Land Cover Atlas

The Land Cover Atlas eliminates the need for desktop geographic information system software, or advanced technical expertise, by providing easy access to distilled information summarizing general change trends and specific changes of interest.

NOAA Coastal County Snapshots

Coastal County Snapshots turn complex data into easy-to-understand stories, complete with charts and graphs. Local officials can use the snapshots as a planning tool to assess their county’s resilience to flooding and understand the benefits provided by natural resources.

NOAA Economics: National Ocean Watch (ENOW) Explorer

This tool allows users to interact with Economics: National Ocean Watch data, which describe six economic sectors that depend on the oceans and Great Lakes. Users can discover which sectors are the largest in various parts of the county, which sectors are growing and declining, and which account for the most jobs, wages, and gross domestic product.
NOAA Roadmap for Adapting to Coastal Risk

The Roadmap for Adapting to Coastal Risk provides a participatory approach for assessing a community’s vulnerability to hazards and for incorporating relevant data and information about hazards and climate into ongoing local planning and decision-making.

NOAA Coastal Resilience Decision-Support Framework

The Coastal Resilience Decision-Support Framework supports decisions to reduce the ecological and socioeconomic risks of coastal hazards. The interactive decision-support framework allows users to visualize future flood risks from sea level rise and storm surge and identify areas and populations at risk to gain a better understanding of ecological, social, and economic impacts from coastal hazards.

NOAA Sea Level Trends

Developed by NOAA’s Center for Operational Oceanographic Products and Services (CO-OPS), this interactive mapping application illustrates regional trends in sea level, with arrows representing the direction and magnitude of change.

NOAA Hazard Assessment Template

This Internet tool helps to construct websites that identify potential hazards for specific locations. The tool’s functionality can be set up for any location that has the required data and resources.

The Nature Conservancy ClimateWizard

ClimateWizard allows users to view historic and predictive temperature and rainfall maps anywhere in the world, along with climate change maps developed by The Nature Conservancy and other project partners.

UKCIP Tools

The United Kingdom Climate Impacts Programme provides this list of additional tools for planners and managers including Adaptation Wizard, AdOpt, and BACLIAT, the Business Areas Climate Impacts Assessment Tool.