

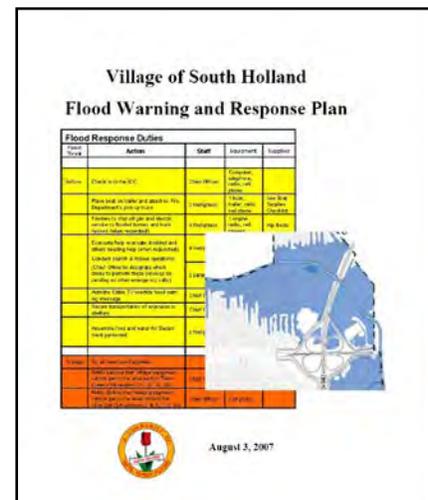
Chapter 6. Emergency Services

Most communities appoint an emergency manager or emergency services coordinator. This person is usually part time, although many communities make it an extra duty for a full-time member of the fire or police department. In times of emergency this person reports directly to the Village President and coordinates the activities of the various Village departments and cooperating organizations, such as the Red Cross and school district.

South Holland's approach is to have a different incident commander for each type of disaster. During floods, the Director of Planning and Development is in charge. The Emergency Services and Disaster Agency (ESDA) Coordinator is primarily concerned with organizing the volunteers who support the Village's emergency response efforts.

Emergency services activities that occur before and during a flood are covered in the "Flood Warning and Response Plan" which was prepared and adopted in 2007. This plan is reviewed by the Village on an annual basis. This chapter reviews the emergency services activities that relate to flooding and identifies how the Village's "Flood Warning and Response Plan" addresses these activities. There are five basic parts to a flood emergency plan:

- 6.1 Flood threat recognition
- 6.2 Flood warning
- 6.3 Village flood response activities
- 6.4 Critical facilities' response activities
- 6.5 Post-Flood Mitigation



6.1 Flood Threat Recognition

6.1.1 General: The first step in responding to a flood is knowing that a flood is eminent. A flood threat recognition system provides an early warning to the emergency managers. A good system will predict the time and height of the flood crest. This can be done by measuring rainfall, snow conditions, soil moisture, and stream flows upstream of the community and then calculating the impact on the community. On large rivers, the measuring and calculating is done by the National Weather Service. Flood threat predictions are disseminated on the NOAA Weather Wire or NOAA Weather Radio.

On smaller rivers, it is up to the communities to develop their own system. This is done by installing rain and river gages in key locations and then using computer models to translate the gage data into a flood threat prediction. Many western and mountainous communities have developed these systems in response to the great threat to life from flash floods. The systems installed in the mountains usually rely on remote gages that transmit data via radio to a central computer station. The cost of the hardware can be several hundred thousand dollars. Where speed is not so vital to protect lives (i.e., outside of mountainous flash flood areas), very successful programs have been established using human gage readers who telephone in the data every 15 or 30 minutes during a storm.

The most important element of either system is that the community is given early notification regarding the impending flood. The more data and the more lead time that can be provided, the better the community can respond. If the system inaccurately predicts the severity of the flood and the potential threat to the community, great amounts of energy and resources can be wasted responding to a threat that didn't exist. A false warning provides an added hazard of the "cry wolf syndrome" and comes with the risk that people may not take the next warning seriously.

On the other hand, a system that under-predicts the hazard can be even worse. The under-estimated flood will catch the community and its residents unprepared. Much damage will occur, especially to vehicles, contents, and other moveable items, that could have been moved out of harm's way.

6.1.2 Use in the Area: In the Chicago area, the National Weather Service's flood threat recognition system provides crest and timing predictions only on the Des Plaines, Fox and Kankakee Rivers. There is a remote reporting gage on the Little Calumet River at Cottage Grove Ave which the Weather Service uses for tracking and predicting flood crests.

Local flood threat recognition systems are rare in the Midwest. Because of the slow rise of floodwaters and the low threat to life, most communities do not feel the need for a system that provides detailed early flood data. The National Weather Service has a program to help communities develop local flood warning systems. This program was used by Glenview, Deerfield and Northbrook to establish a coordinated flood threat recognition system using rain and river gages.

6.1.3 South Holland's System: The Village is advised of a pending flood threat in two ways. First, if it is raining and conditions look like the rivers could rise, staff will check the status of the Cottage Grove gage on the Weather Service's website. This is a public site and a link to it is provided on the Village's website's

(www.southholland.org) flood protection page.

Figure 6-2 gives an example of the information that is provided. Staff will also receive automated notifications as the river levels continue to rise.

When the Little Calumet River is expected to rise, the Weather Service will issue a flood crest stage and time prediction (how high and when) for the Cottage Grove Ave gage

similar to the Weather Wire statement in Figure 6-1. Sometimes a flood crest prediction can be made up to two days in advance. That prediction will also be posted on the gage's website.

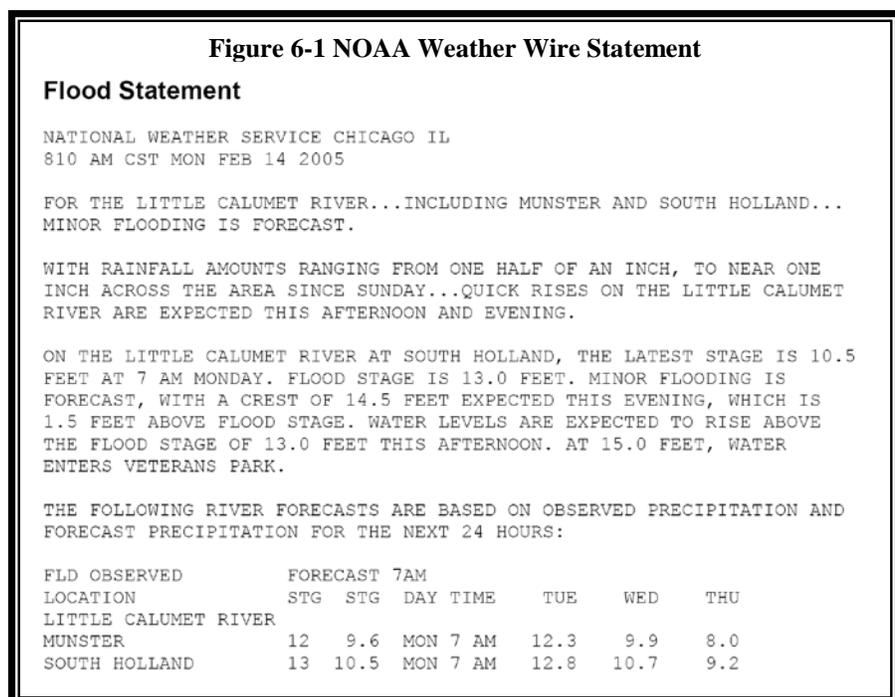
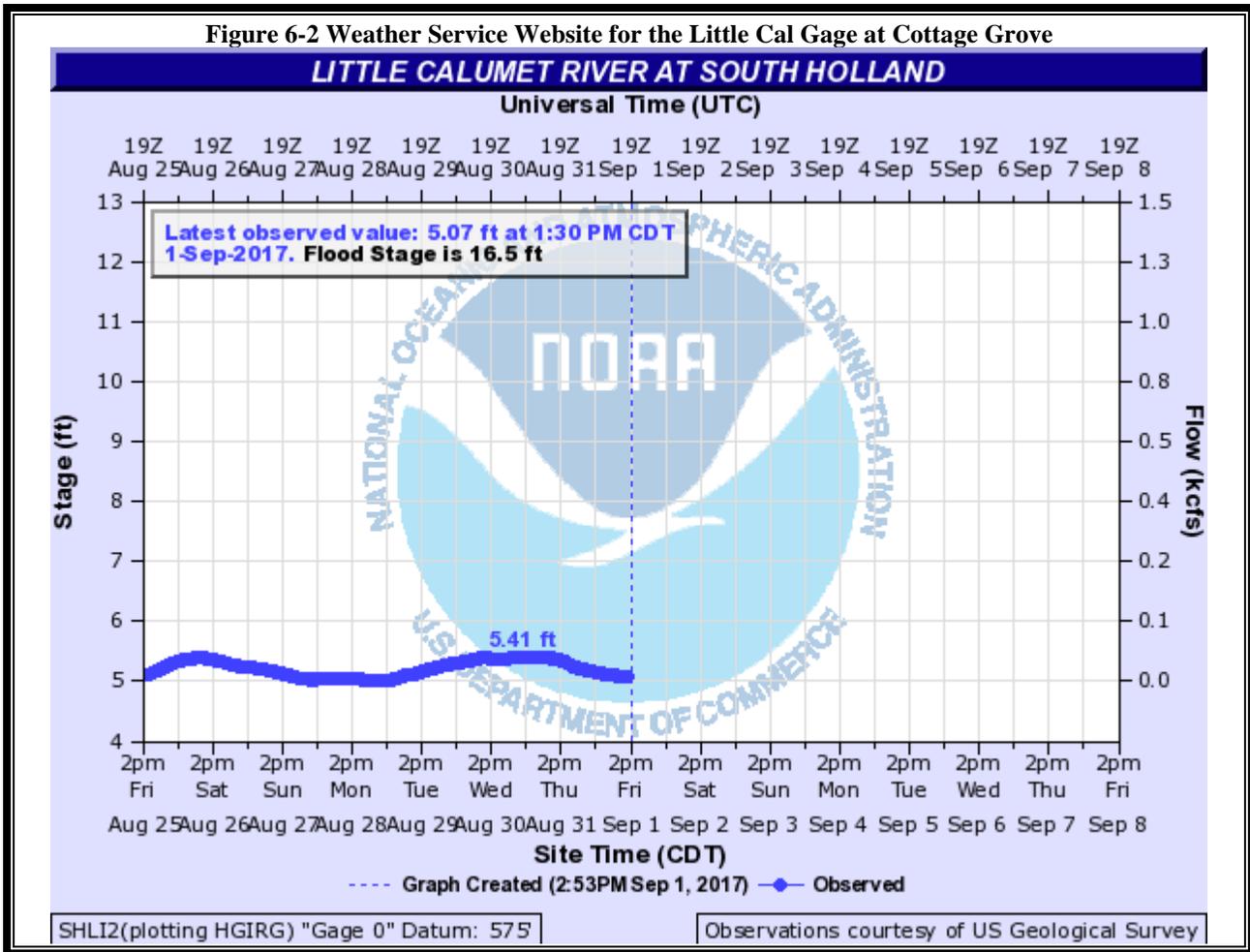


Figure 6-2 Weather Service Website for the Little Cal Gage at Cottage Grove



The second way the Village is advised of a flood threat is through the NOAA Weather Radio. This system issues all National Weather Service storm and flood watches and warnings. A Weather Radio is at the Dispatch Center managed by E-Com for area municipalities.

If the Weather Service issues a watch or a warning related to heavy storms or river flooding, then E-Com’s dispatcher will call the Village’s ICC Director (see next section) and advise him/her of the notice. The ICC Director will check the website and relate the predicted flood stage to the color coded flood level. If the website is not operational or not updated to reflect current conditions, the ICC Director will call the Weather Service’s office.

The current system has generally worked in the past, especially since the slow rising flood waters allow for corrections in the predictions. Village staff has found a significant improvement in the accuracy of these predictions since 1993. They have proven correct to within an accuracy of less than one-half foot during flood threats in 2008 and 2013. This has greatly helped the Village respond appropriately.

6.2 Flood Warning

6.2.1 General: Once the community is aware of the impending flood, the next step is to advise other agencies, the general public and critical facilities that a flood is on the way. The earlier and the more accurate the warning message, the more people can implement protection measures.

There are a variety of ways to disseminate a flood warning. The best approach is to have multiple or redundant systems so if people do not hear one warning, they are likely to still get the message from another part of the system. Figure 6-3 lists the more common warning methods and their scores under the Community Rating System, which is a measure of dependability and utility. This section also awards points for the information provided in the flood warning messages, routing plans for door-to-door and/or mobile public-address warnings, and information provided online (on Village's website). The maximum allowable score for this section of the CRS is 75 points.

These methods of disseminating a warning, be it for floods, tornadoes, or severe storms, are in widespread use throughout the south suburban area.

Figure 6-3 CRS Credit Points for Warning Dissemination Methods

- 15, door-to-door contact or mobile public address systems
- 10, outdoor voice-sound system or fixed siren system;
- 15, telephone system that reaches all floodplain residents;
- 10, using the Emergency Alert System;
- 10, cable television override system;
- 15, other forms of public notification such as geocoded alert products or social media coordination
- 10, tone alert radios or NOAA Weather Radios are used for public announcements.

Source: *CRS Coordinator's Manual*

Most flood warning dissemination programs have two levels of notification:

Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.

Warning: a flood, tornado, etc. has started or has been observed in the area. A "warning" is also issued based on the river gage predictions.

The Weather Service often issues a "flash flood watch" for urban areas, a notice that the amount of rain expected will cause ponding and other flooding on small streams and ditches where much of the watershed has been urbanized.

A complete warning system should have a public information component. Many people are not able to relate a warning to their situation and many others don't know what to do when a flood threatens. Some communities have provided residents with the elevation of the lowest water entry point so they can tell if the predicted flood crest will get into their homes. Many public information programs include information on what warnings mean and what steps and safety precautions should be taken when one is issued.

6.2.2 South Holland's System: The Village issues flood watches and warnings when the rivers reached predetermined stages. The stages for the Little Calumet River at Cottage Grove Ave are shown in Figure 2-2 on page 2-4. The following methods are used:

- Village's emergency cable TV interrupt displays a message on the screen of any television set that is connected to cable and is turned on. The majority of homes in the Village are connected to the cable system.

- Announcements via police and fire department vehicle public address systems. Sometimes, the police or fire staff will knock on doors to be sure that people have heard the message.
- Code Red System (Reverse 911) via land lines and cellular phone systems.
- Signs are displayed near bridges (Figure 6-4).
- Residents can go to the Village’s website and link to the Weather Service’s gage (see Figure 6-2).



Village public information materials advise residents about how warnings are publicized. They also include safety precautions to take during a flood. These are discussed in Chapter 8.

Given the slow rise of flooding in South Holland, the current system is adequate to get the word out to people.

6.3 Village Flood Response Activities

6.3.1 General: The first priority after the flood threat is recognized is to alert others through the flood warning system. The second priority is to respond with actions that can prevent or reduce damage or injury. These actions can be taken by community staff or by others in concert with an overall flood response plan.

A flood response plan is the best way to ensure that all bases are covered and that the response is appropriate to the expected flood threat. The starting point for such a plan is a flood stage forecast map. This map shows what the areas that will be inundated at various flood levels and the facilities that will be affected.

The flood response plan identifies the actions to be taken and which agency or office is responsible. Examples include:

- activating the emergency operations center (emergency manager);
- sandbagging certain areas (public works department);
- closing streets or bridges (police department);
- shutting off power to threatened areas (utility company);
- dismissing school (school district);
- ordering an evacuation (mayor);
- opening evacuation shelters (churches or the Red Cross), and
- arranging for extra dumpsters for the clean up (garbage haulers).

The Village is a member of the South Suburban Building Officials Association (SSBOA). If the need arises, the SSBOA will make extra building inspectors available after a flood event. In addition, they will provide extra personnel and office equipment (e.g. telephones, copiers, fax machines, computers) to expedite the distribution of aid and resources.

Flood response plans are developed carefully in coordination with the agencies or offices that are given various responsibilities. Drills and exercises should be conducted between floods to ensure that the key participants understand their duties.

The plan should be updated annually to keep telephone numbers and contact names current and to make sure that supplies and equipment that will be needed are still available. They should be revised after floods and training exercises to take advantage of lessons learned and changing conditions. The result is a coordinated effort implemented by people who have experience working together so that available resources will be used in the most efficient manner possible.

6.3.2 South Holland's System: If the Weather Service issues a watch or a warning related to heavy storms that will flood streets and affect the entire community, then the outlined procedures are followed. If the watch or warning is related to river flooding, then the Flood Warning and Response Plan is followed.

The Flood Warning and Response Plan is based on a series of flood stage forecast maps. Five flood response levels are used. The levels and the impact of a flood at each level are shown in Figure 6-5. The relation between the levels and past floods are shown in Figure 2-2. The red level is roughly one half foot higher than the highest flood in recent memory, the flood of November 1990, which crested at an elevation of 595.5 feet. The maps of the yellow and red flood response levels are shown in Figure 2-4.

	Yellow	Orange	Red	Purple	Black
Stage	19.0	20.0	21.0	23.0	25.0
Elevation	594.0	595.0	596.0	598.0	600.0
Number of homes affected	21	83	284	1,925	4,514
Other structures affected	11	21	30	120	239
Critical facilities affected	0	1	3	14	38
Streets to be closed	32	57	84	170	193

For each flood response level, the Flood Warning and Response Plan lists specific flood response duties for the following Village offices. The duties for the Incident Command Center are in Figure 6-6.

- Incident Command Center
- Mayor/Village Administrator
- Fire Department
- Police Department
- Planning, Development and Code Enforcement
- Public Works
- ESDA Crews
- Health Department
- Public Information Officer
- Parks Department

Having flood response experiences almost every year has refined the procedures and given the staff valuable training for small floods. After each occurrence, a Post-Flood Evaluation Report is prepared with recommendations for improvements. For example, after the September 2008 flood, the evaluation noted that the number of streets affected by an orange level flood is not as high as the plan reported and that the Village Engineer should double check the figures. These reports have improved the Village's flood response capabilities.

Figure 6-6 Flood Response Duties for the Incident Command Center

Flood Threat	Action	Staff	Equipment	Supplies	
Any	Check gage on website to verify predicted flood level, monitor electronic updates	Director			
	Notify Fire Chief, FAC, Receptionist				
	Advise Mayor, Administrator, PIO of the predicted level				
Yellow	Check gage on the website to verify the predicted flood level	Director			
	Notify Mayor, Administrator, Fire Chief, FAC, Police, Public Works, ESDA, Public Information Officer, Health Department, Red Cross	Director and Receptionist			
	Open ICC	See ICC procedures	See ICC equipment list	See ICC supply list	
	Use Code Red System to send a flood warning to all affected properties	Director	N/A	N/A	
	Monitor reports, record activities	Receptionist			
	Advise Cook County EMA of status every 4 hours. Ask how neighboring communities are doing	Director			
	Check with power, gas, telephone companies on their services and needs	Director			
	Identify if and when utility services are turned off to certain areas	Director			
	Remind Village personnel to keep track of expenses and hours worked	Receptionist			
	Orange	Do all lower level activities			
		Use Code Red System to send a flood warning to all affected properties	Director	N/A	N/A
Advise Love's Travel Stop of impending flood		Receptionist			
Red	Do all lower level activities				
	Use Code Red to send a flood warning to all affected properties	Director	N/A	N/A	
Purple	Do all lower level activities				
	Use Code Red to send a flood warning to all affected properties	Director	N/A	N/A	
Black	Do all lower level activities				
	Use Code Red to send a flood warning to all affected properties	Director	N/A	N/A	

6.4 Critical Facilities

6.4.1 General: Critical facilities are those buildings or locations that are vital to the flood response effort or that would create secondary disasters if flooded. Examples of the former are emergency operations centers, hospitals, public works garages, and suppliers of needed materials. Examples of the latter include hazardous materials facilities, water works, and nursing homes.

Attention to critical facilities is a vital part of a flood response plan. If a facility is flooded, it may draw many workers and resources away from protecting the rest of the community. If a facility is prepared, it will be better able to support the community's efforts.

Most critical facilities have full-time professional managers or staff who are responsible for the facility during a disaster. These people often have their own emergency response plans. State law requires hospitals, nursing homes, and other public health facilities to develop such plans. Many facilities would benefit from early flood warning, flood response planning, and coordination with community flood response efforts.

6.4.2 South Holland's System: The critical facilities identified in the Village's "Flood Warning and Response System" are listed in Figure 2-6. The Incident Command Center has contact names and telephone numbers for these facilities. The Flood Warning and Response Plan identifies responsibilities for contacting those affected by different flood levels.

While there was no damage to any critical facilities during the 2008 flood, most of the facilities do not have their own response plans. The Village could help them develop appropriate flood response plans.

6.5 Post-Flood Mitigation

6.5.1 General: The days and weeks following a flood offer a unique opportunity for flood hazard mitigation, i.e., for taking steps that will reduce the community's vulnerability to damage from the next flood. Once the immediate response efforts and damage assessments are completed, the Village should prepare a post-flood plan for reconstruction and redevelopment of the flooded area. There are four reasons why this timing can be so productive:

1. A flood will bring federal, state, and regional people from various agencies and fields together to focus their attention on the Village and its flood problems.
2. The residents and elected officials will be more interested and more willing to spend time on the Village's flood problems and to try new solutions.
3. If the damage was severe enough, it may be relatively easy to clear out a destroyed area and start anew.
4. If the damage was severe enough to warrant a major disaster declaration, there will be several different sources of money available to buy or rebuild properties so that they will be protected from future flood damage.

6.5.2 South Holland's Program: The 1994 *Floodplain Management Plan* dedicated an entire chapter to this subject, which reviewed the state and federal disaster declaration/disaster assistance timetable. The *Plan* had three recommendations:

- a. The Village should appoint a flood hazard mitigation coordinator as soon as possible. The flood assistance coordinator would be an appropriate person for this position.
- b. The hazard mitigation coordinator should attend training provided by IEMA and/or FEMA and become familiar with post-flood procedures, clean up and repairs, reconstruction regulations, public information activities, and sources of financial assistance.
- c. The hazard mitigation coordinator should develop a post-flood hazard mitigation plan to provide the Village with an aggressive recovery, reconstruction regulation, and public information program to minimize the difficulties during recovery and maximize the opportunities and assistance for mitigation, including funding support for floodproofing or elevating buildings, acquiring flooded properties, and relocating residents.

The Village did make this appointment and the Flood Assistance Coordinator, along with the Village's floodplain management consultant, drafted the *Post-Flood Mitigation Procedures*. The procedures were adopted by the Flood Liaison Committee in 1997. It covers all the issues listed in the 1994 *Plan's* recommendations under the following headings:

- Emergency response (responsibilities, damage assessments, etc.)
- Post-emergency activities
- Building condition survey
- Mitigation approach (reconstruction moratorium, redevelopment planning, etc.)
- Reconstruction regulations (permits, emergency repairs, inspections, estimating substantial damage, contractor quality control, etc.)
- Public information (the mitigation message, media to use, etc.)
- Post-flood mitigation plan (interim guidance, coordination with disaster assistance, etc.)

The procedure paper has been used as a model in other suburbs and other states.

6.6 Conclusions and Recommendations

6.6.1 Conclusions:

- a. South Holland previously had an "ad hoc" flood threat recognition system that has been improved substantially since 1993.
- b. South Holland has successfully responded to recent floods and has prepared for future floods with the 2007 Flood Warning and Response Plan. After the September 2008 flood, an after-action report was prepared with recommendations on how to improve the Plan.
- c. The Village has data on flood prone critical facilities. Some, if not all, of the critical facilities in South Holland's floodplain do not have flood response plans that are coordinated with the Village's flood response efforts.

- d. The Village has a useful set of procedures for post-flood mitigation.

6.6.2 Recommendations:

- a. The Village should implement the recommendations from the critique of the Flood Warning and Response Plan following the September 2008 flood.
- b. The Village should conduct an exercise of the Flood Warning and Response Plan biannually. An evaluation report should be prepared after each exercise and after each flood.
- c. The Village should continue to update its list of floodprone critical facilities.
- d. The Village should continue its outreach efforts to critical facilities to help them develop flood response plans that are coordinated with and support the Village's plan. This effort should start with those facilities in the orange and red flood levels.
- e. Village staff should review, critique, and update the 2007 *Guide to Flood Protection*. This work should use the expected CRS credit criteria as guidelines. The procedures should then be incorporated into the Flood Warning and Response Plan.

6.7 References

- Community Handbook on Flood Warning and Preparedness Programs, H. James Owen, for the U.S. Army Corps of Engineers, 1981.
- CRS Credit for Flood Warning Programs, National Flood Insurance Program/Community Rating System, 2006.
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- Floodplain Management: Local Floodplain Administrator's Manual, Illinois Department of Natural Resources, Office of Water Resources, 2006.
- Guidelines on Community Local Flood Warning and Response Systems, Federal Interagency Advisory Committee on Water Data, 1985.
- Post-Flood Mitigation Procedures, Village of South Holland, 1997.