

**COMMUNICATING THE RISKS OF STORM SURGE AND OTHER EXTREME EVENTS**  
*Online Toolkit and Tutorial*



## Communicating the risks of storm surge and other extreme events

### ONLINE TOOLKIT AND TUTORIAL

This section provides a tutorial for crafting hazard warning messages. This is designed for use by anyone, but it is very relevant for those agency staff, local officials, or community leaders who receive technical weather forecast information and alert others about the need to prepare for the event.

Imagine you receive (whether directly or through the news) technical information from the national weather agency that a large cyclone (also called hurricanes or typhoons, depending on where you are) is predicted to make landfall in your region in three days. Moreover, the experts are predicting that a large storm surge will accompany the storm. Imagine, too, that you want to transmit the information to officials and residents in your municipality. How should you communicate the information to them in a way that motivates them into action?

You will find several resources that can help you in this task. You have a choice of whether to take the online tutorial and click through a short online training module, or to download a report and toolkit that provides the same training. Click on one of the following.



[Take the Online Tutorial](#)



[Download Guidebook and Toolkit](#)

## Online Tutorial

There is considerable research behind the design of this tutorial. This information can be found in the downloadable Guidebook (just go back to the previous page). In this tutorial, we merely provide a brief summary of these ideas.

### Preview

First, we walk through two alternative scenarios below.

#### SCENARIO ONE

Imagine you work in a local government office. A typhoon is forecast to make landfall near your town. The bulletin from the national weather agency also mentions something about a 1.5 meter storm surge. Since it is an official bulletin, and since the agency has the technical expertise in typhoon forecasting, the local government makes sure to send the bulletin to other offices. But the problem is that it looks and reads like a routine technical report. Some other issues:

- (i) Many residents of the community assume it is another technical bulletin and ignore it.
- (ii) No one in your or other agencies is willing to interpret the bulletin and use their own words in telling other offices and residents.
- (iii) While there is an evacuation order, many residents stay mainly at home (including home-bound elderly residents) and news does not reach them.
- (iv) To compound matters, at a preparatory meeting, a high-ranking government official reads the wrong report and mistakenly tells everyone that the typhoon would make landfall hours after the actual predicted time. Lower-ranking staff notice the mistake but are too hesitant to correct the official.

Typhoons are common, and most residents assume they will just do whatever they normally do during these events. The storm surge catches everyone by surprise. Many are caught by the rushing waves at home. Though you and your family survive, many of your neighbors do not. Most of their homes were destroyed by the fast moving surge, and they were caught inside these structures. Later that day, the mayor says, “This is the worst tragedy to have ever struck our community”, and requests the national government for disaster relief aid.

#### SCENARIO TWO

Now imagine a different scenario. You see the storm surge warning from the national weather agency. You make sure you understand what it is saying and, then, proceed to tell the story of what will happen when the typhoon arrives with its storm surge. You tell others and transmit a new message, telling it in your own words to make sure others understand it. You put your message in a memo that you then distribute to the people in your town. Some people say it is okay, they are used to typhoons, but you tell them this will be different from previous ones, and the storm surge will be unlike anything they have ever experienced. All the residents get involved in telling the message to others, especially people who stay mainly at home. At the preparatory meeting, staff speak up and correct the government official, saying the typhoon would actually arrive hours earlier.

The typhoon comes, but most people have left their homes in the high-risk area and stayed either at the evacuation center or with friends farther away from the coast. Though some are injured, there is no loss of life in your community. A day later, families return to their neighborhoods only to find many of their homes completely destroyed. A friend tells you, “We have lost everything. But, you know, we are all safe, we are very grateful.”

**In the scenarios above, it is the same situation but two very different outcomes.**

The truth is, the first scenario describes events that actually occurred (and occur on a regular basis). As you will read in this toolkit, the lessons for us are simple and, yet, so challenging to put into practice:

**Lesson 1**

**EVERYONE** must be involved in **RISK COMMUNICATION**. This way, messages penetrate the entire community, reaching even residents who are isolated at home or elsewhere. By everyone, we mean officials in every agency but, also, community residents (neighbors, children, teachers).

**Lesson 2**

**EVERYTHING** has to be **UNDERSTANDABLE**. Risk information has to be communicated in understandable ways. The boundaries between agencies and between agencies and the public are too rigid. Agencies often communicate in only technical ways and fight over who is to communicate risk information. Members of the public are hesitant to receive and communicate information that they feel is something only for technical for them to manage.

In the following pages, you will find a guide to communicating risks of these types of events. You can go through it on your own or, even better, in a group of others from your organization or community.

One problem with warning people about something like a large storm surge is that, often, these warnings come in technical bulletins from the national agency. People can ignore these warnings because of a number of reasons:

- ❖ national weather agencies focus only on technical analysis and not on communication,
- ❖ the language is technical and does not provide information in easily understandable ways,
- ❖ the technical bulletin looks like something that is not meant for the public,
- ❖ local officials are afraid to interpret or add to the message from the national agency for fear of overstepping their bounds, and simply routinely pass it on,
- ❖ the communication looks like a routine agency bulletin that is business as usual,
- ❖ the public (or local official) does not think that the bulletin addresses their situation directly,
- ❖ the bulletin is not well designed (e.g., does not suggest what actions people can take)
- ❖ the same national and local agencies focus solely on routines (checklists, protocol, rules) that can stifle the free communication of knowledge instead of ensuring it

For these and other reasons, people dismiss these bulletins and ignore or forget them.

There are other reasons why people ignore evacuation advisories and get caught by a flood at home or on the street:

- people think the coming event is just like what they had experienced in the past but, often, extreme events are things the local community has never seen before,
- people naturally associate the home with safety, security, and comfort, even when their home is located in an area of high risk,
- some people are socially or physically isolated (e.g., home-bound elderly) and not well reached by official communication (e.g., evacuation advisories).
- people do not want to leave home because they fear burglary while away,
- people have negative perceptions of the evacuation center and avoid going there.

One root of the problem is that, in many places, government and society draw rigid boundaries:

- (i) between government and the public,
- (ii) between technical and 'lay' communities, and
- (iii) between one agency and another.

The first issue ensures that the public are treated as simply passive recipients of information and are not expected to participate in risk communication.

The second emphasizes information that is technical and difficult for others to understand and pass on.

The third creates in-fighting between agencies as to who is to engage in communication (when, in truth, all have to be engaged) and a tendency to focus only on formal routines (hence the predominance of checklists, forms, classification schemes, rules) and not on the fostering of the free flow of communication.

Though different national and local contexts have different characteristics, we find the above issues to be true in many, if not most, contexts.

As you click through the tutorial, you will find ways to address the problems noted above. Essentially, the recommendations address these issues in these ways:

- ✓ Writing a message that provides the same information but in everyday language
- ✓ Presenting the bulletin in a format (e.g., using color, images, etc.) that catches people's attention
- ✓ Designing the communication so that people recognize the coming event is out of the ordinary
- ✓ Creating messages that address each region or locality directly
- ✓ Ensuring that the communication has the necessary elements of a good message including actions for local officials, residents, and businesses to take.

 **Start the tutorial**



A longer version of the bulletin is shown below. To check that the necessary message elements are all present, click on each of the elements below to see where in the message they appear.

- ① Sender    ② Receiver    ③ Event    ④ Description    ⑤ Guidance    ⑥ Timing

NWS Bulletin.

**STORM SURGE WARNING:** Coastal areas are threatened by a storm surge of 2-4 m high along Southern Isabela province and 0.5-2 m high and those along Northern Isabela province. The Danger level is HIGH beginning early Tuesday morning. A storm surge occurs when extremely strong winds push water onshore, and powerful waves can travel inland for a kilometer or more. Storm surges of even 0.5 m can destroy houses and are life-threatening. Affected communities, please consult your local mayor's office or PDRRMC for evacuation instructions. A detailed map of affected areas is found below.

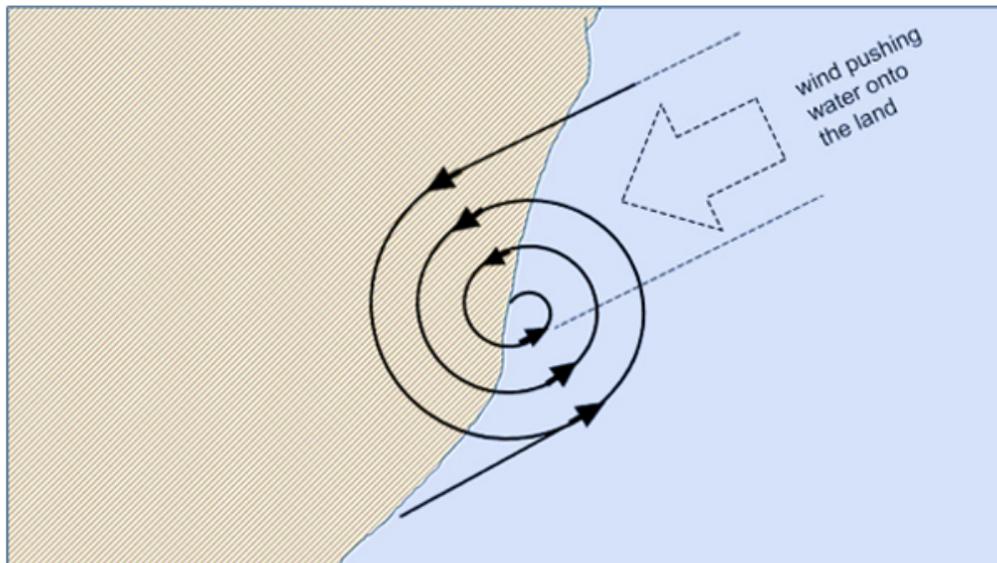
## LESSON 2. UNDERSTANDING THE EVENT

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### What is a Storm Surge?

A storm surge is a rise in the level of seawater that is caused by strong winds pushing the water onshore. The flooding caused by this can be devastating, so the greatest risk from storm surge is to coastal communities. However, a large strong surge can reach up to a kilometer or more inland like a very large wave.

The figure below shows how a storm surge forms. Above the equator, typhoon winds rotate counter-clockwise. The figure illustrates a situation when winds in the northern half of the typhoon are blowing to the west and, so, pushes seawater onshore in the eastern coast of a country. The situation can be reversed on the western coast, when the southern half of the typhoon blows seawater onto the shore.



### What is a storm surge like?

Storm surge survivors report different things occurring during the storm surge. In some cases, as the eye moves through an area, the direction of the wind changes. This can cause the shore to recede initially, as the winds push the water away from the land. And, then, when the wind changes, it can start pushing the water in the other direction, onto the land, forming a storm surge. This was reported by some eyewitnesses during Typhoon Haiyan.

The storm surge can develop rapidly. In some cases, the weather can seem calm, even sunny, hours before the typhoon arrives. But when the winds begin gathering strength, the storm surge can form very quickly, rising several meters in a matter of minutes. This is why people get trapped, as they assume they can wait until the last minute to flee the coastal area.

## LESSON 3. INTERPRETING THE MESSAGE AND PASSING IT ON

### MAIN IDEA:

You should not simply receive a technical bulletin and pass it on. Instead, you should understand and interpret it in non-technical language and be prepared to tell others the message in your own words.

Often, officials and others will simply copy and pass on the agency's technical bulletin without adding to it. They do this because they feel that one has to be an authorized official or expert to do anything other than pass on the bulletin.

But here is the problem: technical messages need interpretation in order for others to pay attention to and understand them. Everyone has the responsibility to translate the information into terms that others will understand more easily.

If you are passing on a message, you should translate the message into one that will be more easily understood. Doing so does not mean that you are changing the information, pretending to be an expert, or assuming a role that you do not officially have. First of all, you can always attach the original technical bulletin. Secondly, your message can acknowledge that you are interpreting the technical message into something that the general public can understand.

Here are some suggestions on how you can interpret technical messages:

- ✚ Rewrite the information using everyday, non-technical terms.
- ✚ Comment on what the bulletin means directly for the people you are communicating with.
- ✚ If a map is provided with the bulletin, interpret the map and tell others what it is saying about their particular location.
- ✚ Add more information about possible effects of the event.

## LESSON 4. TALKING TO A FRIEND: PERSONALIZE, LOCALIZE, DRAMATIZE

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### MAIN IDEA:

The most effective message is one that is told like someone you know telling you a story. This is most easily understood. Also, it is most easily passed on. When you write a message, imagine you are telling a friend the story face to face.

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Often, someone ignores an official bulletin because the bulletin seems like just a routine agency message and the message does not pertain directly to her or his personal situation. For this reason, messages should be written so that they:

### Personalize

Write the message so that it identifies, and addresses directly the recipient of the message. This can be done when you write a message directly addressed to someone or a group of people or directly identifies which group or community is being affected.

### Localize

Write messages for localities, in which the geographic area is directly identified. Messages can also identify local landmarks or known places that will help the recipient imagine where the event will take place.

### Dramatize

Instead of merely giving technical, factual descriptions of the event, the message can provide more vivid imagery or more explicit detail. If this is an unusual or once-in-a-lifetime event, then say so.

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Following the above suggestions increase the chances that the recipients of the message understand that it is talking to them and their situation directly, and it increases the degree of trust they attach to the message.

The following are examples of message elements that are **Personalized**, **Localized**, and **Dramatized**.

### Personalized and Localized

✚ "To the residents of District 4"

✚ "Message for residents who live along San Pedro Bay"

**NOTE:** Even if the technical bulletin is regional, you can always tell a local community that the bulletin is relevant to their local area with a header like "Message for Residents of Santa Ana".

<b>Dramatized</b>
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- + "the storm surge may be like a destructive 3 meter wave moving at high velocity"
- + "houses may be torn apart and trees uprooted"
- + "this may be worse than any flood we have ever experienced"

**NOTE:** On the next page, you will be provided with descriptive terms that you can choose from to describe a storm surge. You do not have to be an expert to use these terms, because they have been selected to be applicable to large storm surges or large flood events.

## LESSON 5. ADDRESS KEY ISSUES

In any population, there will be key issues that prevent people from following evacuation and other advisories. Because of this, they can stay home and put themselves in danger. The following are some common issues and examples of language that one can put in the message to address these.

<b>ISSUE</b>	"Home is the safest place to be"
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**WHAT MESSAGE CAN SAY:** If you live in District 8, your home is in danger of being destroyed. It is too dangerous to stay home. Move to the evacuation center.

<b>ISSUE</b>	"The evacuation center is dirty, unsafe, and uncomfortable"
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**WHAT MESSAGE CAN SAY:** The evacuation centers have been prepared to ensure your safety and comfort. Health and social workers will be at the evacuation center to help you be comfortable.

<b>ISSUE</b>	"Our house will be burglarized while we are away"
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**WHAT MESSAGE CAN SAY:** The health and safety of you and your loved ones is more important than your possessions. Roving patrols will watch for burglars in your neighborhood.

<b>ISSUE</b>	"This is just like the previous storms"
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**WHAT MESSAGE CAN SAY:** This storm will be worse than anything we have experienced in the past. The storm surge will be higher and stronger than any flood you have experienced.

## LESSON 6. USING MAPS

A map is a powerful way of describing a forthcoming extreme weather event. Maps can show the predicted track of an oncoming typhoon, or they can show predicted levels of storm surge flooding.

However, there are some issues regarding the use of maps:

Agencies can assume that a map can contain and communicate all the relevant information.

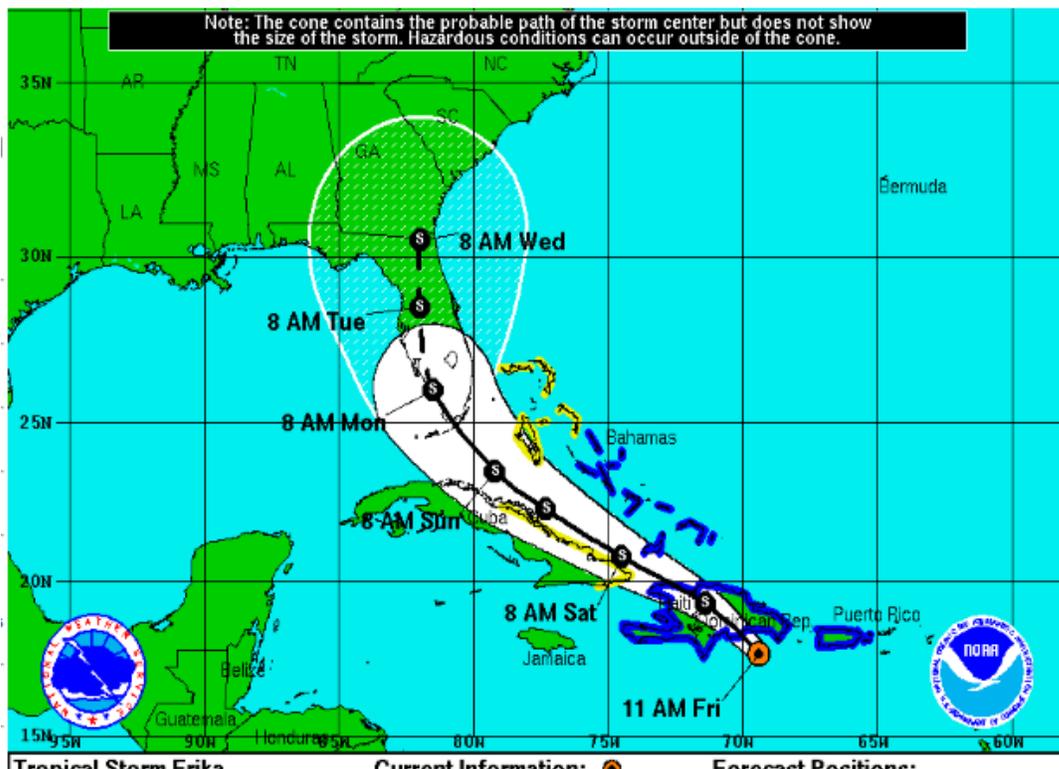
In contrast, many people are not sure how to interpret the maps and, for some, maps are not understandable.

Maps are not the primary means of wayfinding for some people and communities. In some cases, the meaning of the map needs to be put in the form of text, as well.

A good idea is to test how effective a map is, and whether or not people interpret it correctly.

Take the figure below, which shows the trajectory of an oncoming typhoon. Imagine a survey respondent looking at the map for the first time and being asked questions such as:

- ✚ Can you tell, from the map, when the typhoon will arrive at your town?
- ✚ Why does the size of the area covered by the track increase as the storm moves onward?



Similarly, consider a storm surge flooding map, such as shown below, and imagine the surge respondent being asked the following questions:

- ✚ Can you find your place of residence on the map?
- ✚ Can you judge what the predicted flood height will be for your area?
- ✚ Given the previous storm surge track, by when do you think you should evacuate?

There are some problems with relying only on maps:

- ❖ Some people may not understand their area in a map-like way. For example, some people figure out how to get from one part of town to another without imagining or using a map.
- ❖ Other people may not be motivated or inclined to read and interpret a map and would rather read or hear direct information and advice.

As an example, in one survey, a sample of residents in a community were asked to study a print-out of a storm surge flood map and asked to locate their homes on the map and interpret how deep the predicted flood would be in their area. Only about 83% of them were able to indicate locations of their homes on the map (though not all did so accurately). Of those who indicated their homes on the map and provided their addresses, only 55% of those did so accurately.

This means that if the main mode of warning a population about an incoming cyclone and storm surge, you should translate the map into a message for that community, telling them when to expect the storm surge and what areas would be most affected.

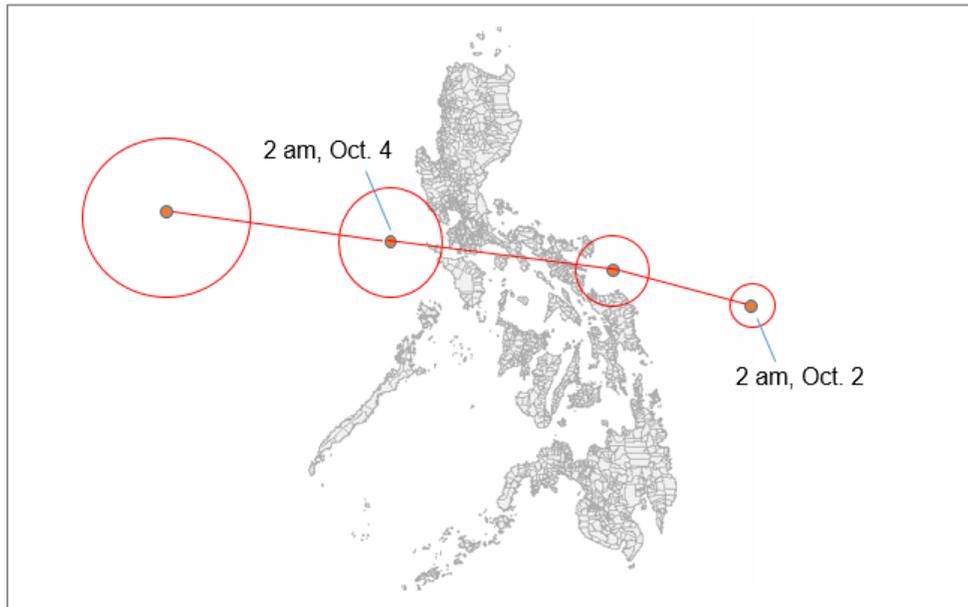
Instead of relying on maps alone, think of combining maps with words. The key is to write the message (and design the map) so that people will still get the information they need if the map is missing or the message is missing.

## EXERCISE 1

(PART 1: Tracking the Storm)

### Interpreting Weather Bulletins

Imagine you are the disaster risk prevention officer for the local municipality and you receive the following from the national weather agency:



Here is a close-up of the map:



Study the maps above, as you answer the following questions.

**Question 1.**

Suppose you live in Balangiga. When will the typhoon arrive in your area?  
(Give day and time.)

<b>Answer:</b>	
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**Question 2.**

Suppose you live in Balangiga. Are you in the path of the typhoon?  
Explain your answer.

<b>Answer:</b>	
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**Question 3.**

Why do you think the circles get larger and larger as the typhoon gets closer and closer?

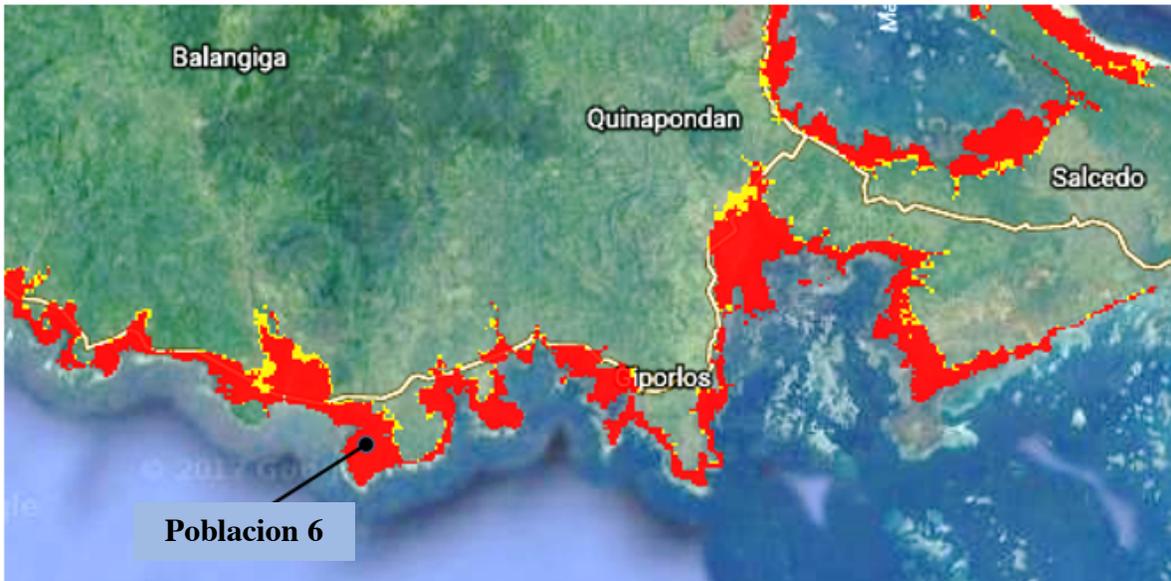
<b>Answer:</b>	
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**EXERCISE 2**

(PART 2: Storm Surge and Flood Warnings)

**Interpreting Weather Bulletins**

Imagine you work at the local barangay office in Poblacion 6 in Balangiga and you receive the following storm surge hazard map from Manila:



Legend:  1 m flood  
 2 m flood

**Question 1.** Is there a danger of storm surge in your area?

**Answer:**

**Question 2.** How severe will the storm surge be in your area?

**Answer:**

**EXERCISE 3****The Necessary Ingredients of a Message**

The bulletin on the right was received from the main office of the national weather office, along with the maps shown on the previous pages.

**Question 1** Can you find all the necessary elements of a good message in the bulletin?

**Answer:**

**Question 2** What elements are missing?

**Answer:**

A storm surge warning has been raised for parts of Region 2. Surge heights of up to 1.5 meters are predicted.

**Question 3** By typing directly inside the box, please write text in order to add the missing elements to the message.

**EXERCISE 4****Talking to a Friend: Translate, Personalize, Localize, Dramatize**

Imagine you are having a sincere conversation with someone you know, and you warn her or him about the risk of a storm surge face to face. This is how you will write your message.

Now, follow these instructions:

**STEP 1**

## Translate

Is there language that is too technical and formal for the public to understand? Try rewriting these words or passages.

**STEP 2**

## Personalize

Rewrite words in the message on the right so that it addresses someone directly (i.e., talks in second person: "you" instead of "they").

**STEP 3**

## Localize

Modify the message so that it identifies a specific group of people or location and talks directly to them.

**STEP 4**

## Dramatize

Add words or sentences that describe the coming event (storm surge) in a way that it is easier for the reader to picture what will happen.

(text copied from previous page)

**EXERCISE 5****Addressing Key Issues**

You can improve the message even more by adding sentences that address key issues that make people ignore or choose not to follow evacuation warnings.

Follow these instructions:

**STEP 1**

People think home is safe

Add words or a sentence to the message on the right that tells people that they are in more danger if they stay at home.

**STEP 2**

People dislike evacuation centers

Add words or a sentence that assures people that conditions at the evacuation center are good or, at least, not as bad as expected.

**STEP 3**

People worry about theft

Add words or a sentence assuring people that there are measures to guard their neighborhood, or that their health and safety is worth more than their property, or both.

(text copied from previous page)

**STEP 4**

This storm is just like previous ones

Add words or a sentence that tell people that the coming storm and storm surge will be worse than anything they or the community has ever experienced in the past.

**STEP 5**

Check your language

Take a look at the text you have written. Is it easy to understand, and is it written as if you were talking to someone you know? If not, you can rewrite any part of it.

**EXERCISE 6****Compare the New Message to the Old, Sharing It**

Now, compare the original message to the new one you have just written (below). Think about how the new message might be received differently, by members of the public, than the new one. If you are working on this in a group, you can share thoughts and exchange ideas about communicating this type of information.

Old Message

A storm surge warning has been raised for parts of Region 2. Surge heights of up to 1.5 meters are predicted.

New Message

(copied from previous box)

Write down some notes about how you would then share this with officials, residents, and others in your community (whether in writing or verbally):

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If there is broad representation among the group, you can divide participants up into sectors or subgroups (e.g., women, elderly, youth) and ask each subgroup about what improvements/edits/suggestions they have for the message (produced in the exercise) and the toolkit in general.

This can be a long discussion, so do allocate plenty of time for this step. Ideally, the discussion would be recorded or, at least, have someone take detailed notes. It can start with a statement like, "Please share how experiencing a typhoon or disaster can be different or more difficult for you" and other "Now start reflecting on how we can improve the message or the toolkit to reflect your experience and concerns". Often, a participant will give a very brief answer, and the moderator should always ask a follow-up question like "Please tell us more about that" to solicit more from the participant.

**EXERCISE 7****Process and Institutions**

An optional exercise is to have a discussion, among the entire group of participants (or, alternatively, in small groups) concerning how the new practices of risk communication can be integrated or be made a part of the existing Early Warning System or Emergency Response System.

Also, think of who, in the community are most vulnerable or most isolated. Who are often excluded from communication like this (e.g., home-bound elderly)? How can the communication process be modified to better reach them? How can they be included in the risk communication process (and, moreover, in these workshops)? Should representatives from these groups act as spokespersons (who deliver messages themselves through different media, such as radio)?

This can be a long discussion, so do allocate plenty of time for this step. Ideally, the discussion would be recorded or, at least, have someone take detailed notes.

**EXERCISE 8****Safe Haven Game**

The game is played with two or more small groups (ideally, between 3-5 people per group). Each group picks a Situation Card which describes a typhoon-and-storm-surge scenario for a town. Each scenario provides a typhoon track and velocity, along with a storm surge warning. The group then takes the information given and deliberates over what the information means and what evacuation actions to recommend (including selecting a suitable evacuation center).

The game is timed, and the groups raise their hand when they are finished. Each group brings their work to the front and explains their analysis. Winners are determined in order of speed of completion of the task, and prizes are given to all. During their explanation, the moderators play the role of community leaders and asks questions meant to simulate things one might hear from members of the public.

The groups are each given a large map of an area, showing elevation contours and locations of local schools that might be used as evacuation centers. They are given colored crayons to draw on the map with.

A sample Situation Card is shown below, with questions the group is to respond to.

**SITUATION A**

You are the designated local disaster risk reduction officer, charged with planning of pre-typhoon evacuation. You receive the following information from the national weather office:

Current Date: \_\_\_\_\_

Typhoon Claudio is 280 km southeast of \_\_\_\_\_ and approaching with a speed of 10 km/hr. It will strengthen into a Category IV cyclone on the Saffir-Simpson scale. The area is at risk for storm surge, which can reach a height of 1-1.5 m.

You are provided with a large map of the town showing elevation contours and locations of key facilities, including local schools that can be used as evacuation centers.

To prepare the evacuation plan for the town, you must answer the following questions.

1. When will the typhoon arrive?

**Answer:**

2. If you evacuate people, when should you do it?

Answer:

3. What area is to be evacuated? Show this on the map by shading the area red.

Answer:

4. To where should they be evacuated?  
Select two possible locations on the map by coloring the locations yellow.

Answer:

## 5. Reporting

As soon as you are done, raise your hands and let the moderator know.

Each group then presents their work and explains the decisions they made in front of the rest of the workshop participants. The moderator takes the role of a local community leader who is skeptical over the proposed plan and asks a number of questions such as the ones shown below.

- ✓ "So this is another typhoon. How is your plan different? We will proceed like we normally do."
- ✓ "What do you mean by a storm surge?"
- ✓ "Nobody will go to the evacuation center. Everyone knows it is crowded and unsafe. Mothers will not bring their newborn babies there."
- ✓ "Safer if each resident instead stays home and strengthens the doors, windows, fastens the roof."

## 6. Follow-up Exercises

6.1

After all the groups have reported, the moderators lead the participants through a reflection exercise. There are two parts to the reflection. The first is showing a large print-out of the geohazard map for the town, which shows that one school location is shown as being outside the hazard zone. The question the moderator poses is: the national disaster risk management agency says to use the official hazard map, which shows that one of the evacuation sites you rejected can be used. What do you do? What do you say?

6.2

The moderators then lead a discussion around what everyone learned in the tutorial game and how both can be improved.

## 7. Assessment

Survey

The final part involves the participants filling out a post-exercise survey. This is to be compared with a pre-event survey previously filled out by the participants.