



Risk Assessment

AWOC Core IC 5



Welcome to the Risk Assessment lesson. There are four lessons in this module and this is the first one.



Course Completion Info

Tabs - 4 Tabs (Including Introduction)

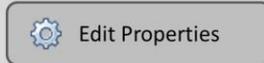
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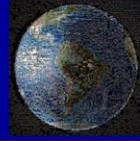
Motivation

- Social Media in Service Assessments
 - Mentioned in most assessments since 2009.
 - Numerous best practices and recommendations.



The use of social media to communicate information to partners and the public has been noted in almost every service assessment conducted on the National Weather Service since 2009. These assessments have included social media as topics of several findings, best practices, and recommendations for future operations. They have evolved over time from recognizing social media as a tool and exploring its usefulness to recommending that social media be incorporated into daily operations with support from appropriate training and policies. Today, social media use in the National Weather Service is nearly ubiquitous, and the next four training modules are designed to support those efforts.

Big Picture



1. What decision processes do people go through in high risk situations?
2. How can NWS help people make the best decisions?
3. How can social media be used in routine operations to help during significant events?
4. How can social media be used before, during, and after significant weather events?

This slide shows a big picture of the content contained in the next four modules. Each one of these questions here represents the key question that module is about. And hopefully this will provide a guide for us as we move along. So we are going to look at, in the first module, what are the processes that each person has to go through when they want to make decisions when “A tornado is at my door,” or “There is a blizzard coming,” or “The roads are beginning to flood,” and “What should I do about it?” How do you get from realizing there is a threat to making a decision regarding what you are going to do about it?

Once we know that, we can then look at, in the second module, how the National Weather Service can best help people make those decisions. Then, we transition to looking at social media specifically, and look at how can we use social media during both routine operations (in the third module), and surrounding significant events (in the fourth), to help people make those decisions.

These modules will primarily focus on communications with the public. For communications with partners, please see the Communicating Risks in High-Impact Events module.



Learning Objectives

- Identify how people decide what to do in high risk situations using:
 - Protective Action Decision Model
 - Social influences
- Empowering the public to make decisions
- Identify how trust is built between the NWS and the public.
- Identify the benefits of social media.

Honing in on this first lesson, we said that we want to look at the decision-making processes that people go through when it looks like there's going to be a significant weather event. So when they first hear that there is going to be a blizzard, a flood, or a supercell in the area, how did they go from hearing about that at first to make the decision about "What in the world should I do about that?"

Now, that decision-making process can be affected by a bunch of individual processes that they go through, and will look at those using the Protective Action Decision Model as a guide, and they can also be affected by social influences that they get from people around them. With those influences in mind, we will look at the importance of empowering the public and their decision-making, the importance of trust, and the benefits using of using social media.

Once you have reviewed these learning objectives, click the next button to continue to the next slide.

Protective Action Decision Model (PADM)

- Availability of Information
- Predecision processes
- Perceptions of hazard
- **Protective action decision making**
- Behavioral response



See the Notes and Resources tabs for more information.

So, how do people go from hearing about a significant weather event that may potentially affect their area to making a decision about what they're going to do about it? This is an active area in social science research, where several models have been created to describe this process. One that is easily applied to our purposes is the Protective Action Decision Model authored by Michael Lindell and Ronald Perry in 2012.

The authors state that the first influence on our decision making is the availability of information. If there is no information available, then we have no information with which to make any decisions. Then, we go through a set of pre-decision processes regarding that information. How we perceive the hazard itself affects what decision we are going to make. And then, if we decide that we do need to change what we are currently doing and take action for our own safety, then we need to consider: what options are available to us, and which of those actions are we going to take? After considering all of those things, we finally are going to take the action that we think is best going to guarantee our safety. We are going to go through each of these steps in the following slides as well as insert some notes from other risk assessment models that apply to each step.

[The original PADM paper can be found by clicking on the Resources button on the top right of the player. Additional information adapted from the *Persuasion Handbook* which can also be found in the Resources. Picture from <https://www.flickr.com/photos/oakleyoriginals/5419401474/>]

PADM: Availability of Information

Information
Predecision
Perception
Decision
Response

- Availability of Information
 - Access to environmental cues, TV, radio, phone, app
 - Social cues
 - Watch, Warning, Advisory issuance



The first step in the Protective Action Decision Model is the availability of information. Obviously, before anybody can take action to increase their safety from a weather event, they need to know that event is actually ongoing. They need news! The information about the event needs to be available. But we can't always pay attention to one source, so they need to make sure that they have access to different types of news. The most direct type of news that exists are environmental cues. If somebody is looking out a window, or is outside themselves, they can look up to see unusual clouds or dark skies. They might also be able to notice if it's hot or cold, or usually windy or humid.

If they can't see outside, the next best sources of news has traditionally been TV or radio. After that, somebody might use a phone to call somebody or they might look to a phone app or social media.

Another important source of information comes from social cues. If people are talking about an event, or they are shopping for essential items, or if they are taking safety immediate actions (such as going into a storm shelter), these actions can help inform you what type of storm is about to come and what actions you might need to take yourself. The best way the National Weather Service can add to the usefulness of these other sources is if an advisory, watch, warning, or other product relating to an event has been issued.

[Photo from <https://www.flickr.com/photos/ultrahi/265997498/>]

PADM: Predecision Processes

Information
Predecision
Perception
Decision
Response

- Predecision processes
 - Attention
 - Reception
 - Comprehension of information



Of course, having the news available is necessary, but it doesn't do anybody any good if the news just goes in one ear and then goes immediately out the other. People first have to be paying attention to the news, then they have to receive the information that they are paying attention to, and comprehend both what it means and how it applies to their current situation. Comprehending the message of news in general, and the warning more specifically, involves both understanding the significance of warnings, in general, and this warning, in particular. How individual people go to these pre-decision processes provides a basis for how each person will perceive the threat that they face and that will shape what decision they eventually decide to take.

PADM: Perceived Severity of Threat

- Perception of hazard
 - Location and trajectory of threat compared to you
 - Certainty and severity of impacts
 - Ability to deal with risks faced
 - Responsibilities to other people or institutions



Important perceptions about a threat are formed from the pre-decision processes that we went through on the previous slide. Once a person is aware that a potential threat might exist, and might affect people in the area, they will begin to seek confirmation that the threat does indeed exist. Along the way, they may decide whether they even believe that the threat is a significant issue. If they do decide that the threat is both real and will affect people around them, then they need to decide what they're going to do about it. That decision depends on the person's perception of both the current location and trajectory of the threat, how certain they are the threat is going to impact people, and what the severity of those impacts might be.

Now, knowing those details are important, but perhaps even more important than just knowing what the threat is, where it is, and where it's going, is where it is in relation to you and where its trajectory is in relation to where both you are now and where you will likely be in the near future based upon your current plans. This step extends the confirmation of the threat that people already went through to now personalizing to threat to their own situation, which makes it more likely that they will seek to take action sooner.

Although this personalization of the threat is important in realizing that you need to take action, a detrimental effect is that this is when a person may have to begin to deal with their perception of their own ability to physically and emotionally handle and deal with the risk that they are facing. For some people these emotional reactions may potentially be difficult to work through and overcome.

Additionally, once a person decides they need to take some action, an important perception in addition to the threat itself and their own safety is their responsibilities to family. Many people want to assure the family is together before sheltering. Responsibilities to friends, elderly, the disabled, or institutions (such as a workplace, church, or volunteer organization) can also weigh heavily alongside the need for their own safety.

PADM: Decision Making

Information
Predecision
Perception
Decision
Response

- Making decisions
 - Consider resources
 - Consider impediments
 - Coping with emotional distress



Once a person has decided that they should take some action, there is often a range of options that they can choose from. They have to consider what resources are nearby that can help to increase their safety, where those resources are, and how long it will take them to get there. Perhaps they are considering going into a basement, going out to a shelter, or going to some nearby stronger structure. They also have to consider what impediments stand in the way of them being able to get to and use those resources. Perhaps, in this example, there is too little time to get to the nearby structure. That would narrow your options to the shelter or the basement. But perhaps you choose to go to the shelter but find that it is locked and you can't find the key to open it. Now, the basement would be the only option left.

As each of these options are considered, what people are doing is projecting their future status. They're projecting their future location, the location of the threat compared to where they expect that they will be, how the threat itself is going to change in severity, and what opportunities they will have (if they choose to take that particular action) to change course if it becomes necessary. Once again, as we mentioned in the last slide, people will have to continue to deal with any emotional stress they may have as they decide what actions they should take.

PADM: Behavioral Response

Information
Predecision
Perception
Decision
Response

- Behavioral Response
 - As action is taken, continue seeking information.
 - With new information, continuously update steps in their protective action decision making.
 - Consider time constraints.



Once a person decides the best action they should take after considering everything that we've discussed over the last four slides, the process doesn't end. As people carry out their chosen action, they will naturally continue to seek out further information about the threat. As the new information is either observed or received, it gets processed through all the previous steps that we discussed, and then what action they should take gets updated or changed as necessary. Thus, this Protective Action Decision Model is an iterative process. People don't just go through it once. It happens several times, with many of the steps taking place subconsciously.

Unfortunately, this process is often happening under a significant time constraint. With many events, you only have a certain amount of time between learning of the event and being able to take appropriate actions to maximize your safety. This time constraint often prevents people from making the best decision possible under their circumstances.

Protective Action Decision Model (PADM)

- Availability of Information
- Predecision processes
- Perceptions of hazard
- Protective action decision making
- Behavioral response
- Get the message
- Pay attention
- Does this affect me?
- What should I do?
- Am I OK? Do I need to do something else?

See the Notes and Resources tabs for more information.

As a summary, another way to think about the steps of this model is through the phrases on the right. People have to get the message, pay attention to the message, ask themselves “Does this affect me?”, then “What should I do about it?”, and finally “Am I OK now or do I need to do something else?”

To reiterate, this is one model of many, and just like conceptual models in meteorology, it represents an idealized situation. People may not go through these steps in order, and many of the steps may be processed subconsciously.

[The original PADM paper can be found by clicking on the Resources button on the top right of the player. Additional information adapted from the *Persuasion Handbook* which can also be found in the Resources.]



PADM Interaction

Quiz - 1 question

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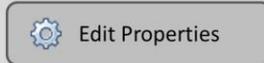
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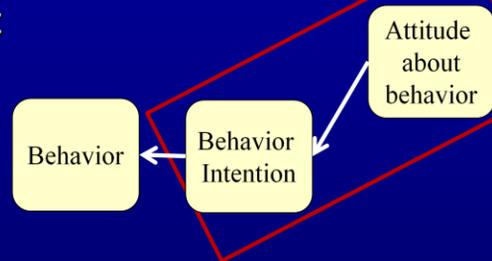
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Social Influences: Attitudes

- People complete what they intend to start.
 - But what controls our views and intended actions?
- Prior discussions
- Influence from media, organizations, social and political groups.



Adapted from Hale et al., 2002

See the Notes and Resources tabs for more information.

Although we are done with the Protective Action Decision Model, it is important to note that those processes don't happen in a vacuum. Also informing the pre-decision processes and perceptions of the threat are various social influences. I will be using a chart on the right to help explain how these processes work.

Naturally, the behaviors that people take are most influenced by what behavior the person intends to take in the first place. If you decide that you need to go into the bathroom and put a mattress over your head to protect yourself, that is probably what will happen. But the question here is, in addition to the Protective Action Decision Model we just went through, what social influences are involved in someone making those decisions?

The first influence is a person's attitude about each particular action. Do they generally view a particular action favorably or not? People don't just form these attitudes on their own out of thin air. They are largely influenced by the topics, tones, and dominant opinions that have been expressed during various discussions a person has been involved with in the past. For example, if a tornado is coming, what may be best for their safety might be to get into a tornado shelter. However, if the person has a negative view of tornado shelters because all they have heard about shelters are that they are small, uncomfortable, filled with bugs, are generally dirty and they view getting into a ditch more favorably, then they may wind up deciding on the ditch.

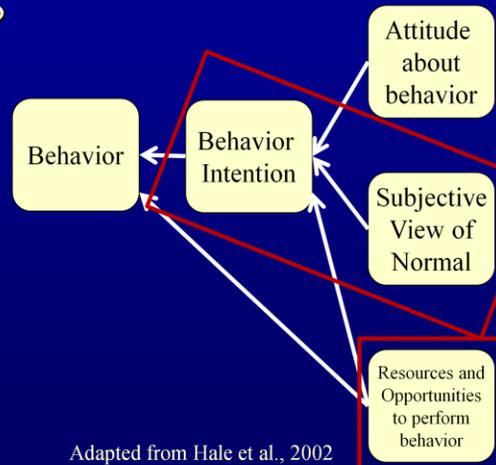
Potential influences on these decisions come not only from the discussions that each person may have had with their friends and family, but also how the media has chosen to cover similar events in the

past, the context that various organizations have placed around the threat and their associated safety actions, and how social and political groups have discussed the threat. In addition, how society reacts to the messages from each of these groups may cause ripple effects that influences someone's viewpoints.

[Chart adapted from Hale, Jerold L., Brian J. Householder, and Kathryn L. Greene, 2002: The Theory of Reasoned Action. *The Persuasion Handbook*, James Price Dillard and Michael Pfau, Ed., Sage Publications, Inc., 259-286. More information about *The Persuasion Handbook* can be found by clicking on the Resources button on the top right of the player. Additional information adapted from the *Social Amplification of Risk* which can also be found in the Resources.]

Social Influences: Normality

- What are others doing?
Should I conform?
- Actions of peers more important than actions of society.
- What resources are available?
 - What if I find out a resource is actually not available to me?



Adapted from Hale et al., 2002

See the Notes and Resources tabs for more information.

In addition to a person's own personal attitude about each safety measure, their subjective view of what is normal can be very influential. In other words, what is everybody else doing to take action during this threat? Importantly, this is a subjective view of what is normal. What the person thinks most people are doing may not be what they are actually doing. Most people may not feel the need to get milk in advance of a winter storm, but if the person thinks that is what most people are going to do then the person will be more likely to conform.

Specifically, the attitudes and resulting actions of peers and direct family members are more influential than those of society as a whole. As we know, even if you know what the best action is to take, many people don't want their friends to think they made a silly decision.

As we've already discussed, the final influence for what action people intend to take comes from what resources and opportunities for safety they believe are available. But, if in the process of taking that action you suddenly find that your preferred resource is actually not available, then you of course have to do something else. Your original intention will be overridden by the unavailability of your chosen safety method.

[Chart adapted from Hale, Jerold L., Brian J. Householder, and Kathryn L. Greene, 2002: *The Theory of Reasoned Action*. *The Persuasion Handbook*, James Price Dillard and Michael Pfau, Ed., Sage Publications, Inc., 259-286. More information about *The Persuasion Handbook* can be found by clicking on the Resources button on the top right of the player. Additional information adapted from the *Social Amplification of Risk* which can also be found in the Resources.]

Drag and drop red items that socially influence people's decision making onto the blue box.



- Opinion of Friends
- Location and Movement
- Opinion of Friends
- Impression of Common Actions
- Media Coverage
- See Dark Clouds

Social Influences Interaction

Quiz - 1 question

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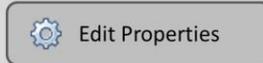
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Empower the Public

- People make the final decisions!
 - Facilitate understanding of safety considerations.
 - Empower people to think through their possible actions.
- Try to:
 - Reduce time to make decision.
 - Make better decisions.



Now that we know what people tend to consider when they think about what actions they should take, we want to work to understand what role the National Weather Service should have in helping people make the best decisions possible. One of the implied conclusions from the Protective Action Decision Model is that it is the people who make the final decision about what action they should take. The National Weather Service can provide suggestions about what actions are going to maximize their safety, but it is the individual people themselves that have to make the final decision.

With this in mind, our key goal when we communicate should be to empower the public to make the best decisions possible. We need to work to increase the strength of each person's belief in their own ability to complete the tasks involved in finding the shelter and safety that they need. In other words, the goal should not be to attempt to control people and what they do. Instead, we want to facilitate people's understanding of important considerations during high impact weather events and empower them to think through their specific situation to determine what actions will most assuredly lead to their safety.

If this is successful, there should be two big results. First, it should reduce the amount of time it takes for people to go through the decision-making process because they are more confident in what they know. Second, this should result in people being able to make consistently better decisions in the end because they know they are well-informed about safety measures as they pertain to their own responsibilities. So how do we make that happen?

[Picture from <http://2015.summerofcode.be/images/studentsparticipate/communication.png>]

Develop and Maintain Trust

- Trust - discussion between two parties.
 - Requires credible, truthful, and consistent information to be provided and updated.
 - Trust reduces ambiguity and speeds decision making.



Before you can empower people, one of the key prerequisites is to get and maintain trust between the National Weather Service and the public. It is critical to accomplishing our mission and affects how we communicate to them. Trust always originates from a conversation between two parties. And to maintain that trust, both parties have to remain involved in that conversation. In our world, that discussion centers around the National Weather Service consistently providing and updating credible and truthful information.

The authors of the Protective Action Decision Model emphasized the need for credibility. They stated that an extremely credible source might obtain immediate compliance even with a directive to evacuate an area at risk. The important lesson is that the more stages in the Protective Action Decision Model that the warning authority neglects, the more ambiguity there is likely to be for the message recipients. Because of this ambiguity, people will continue to seek and process information rather than prepare for or implement protective action. The real danger comes when people continue seeking and processing information until they find it is too late to do anything to seek shelter. In other words, the National Weather Service gaining and maintaining trust with the public can shorten the decision-making process of the public while also resulting in better decisions. Accomplishing this will go a long way toward fulfilling the National Weather Service mission of protecting lives and property.

Know Your Audience

- Must know:
 - How audience **feels** about a risk
 - How closely a risk is perceived to **affect** them
- Must know:
 - Amount of **trust** in the authority
 - How **message** effectiveness is impacted
 - How to continually **adapt** to changing situations



We said that trust surrounds a two-way conversation, and that to fulfill our end we need to consistently provide and update credible and truthful information. But that conversation goes a lot smoother when you know your audience. The Protective Action Decision Model provides general steps in the decision-making process, but the specific content that is being processed varies with each hazard. And as we know, people in different forecast areas, and people in different parts of each forecast area, react and process those hazards differently.

For example, tornadoes cover a tiny area. But if a community has suffered from a strong tornado recently then they may feel very threatened by a later forecast that mentions the slight possibility of weak tornadoes several counties away. Conversely, a winter storm generally covers a very wide area. But if that community hasn't suffered any large impacts from winter storms recently, then a later forecast for a strong winter storm that is focused a similar distance away may not concern people that much. In reality, the community may have a greater chance of experiencing severe impacts from the forecasted winter storm than the tornado potential, but the community may react more to the tornado potential due to recent events.

Of course, you must also know how much trust each community has in you, the warning authority. Once you know your audience and what they mentally go through during each type of crisis, you can then begin to understand what characteristics of your message will impact its effectiveness. In doing this, just keep in mind that your audience and what impacts them can change with time. Thus, you must be able to recognize that change when it happens and be willing to adapt to meet their needs.

Importance of Trust

- “Strong, trustworthy relationships prior to a risk event can decrease the emotional impact of the event.”
 - *Understanding Risk Communication Best Practices, Study of Terrorism And Responses to Terrorism*



See the Notes and Resources tabs for more information.

There are a couple of important notes to go through before we leave this idea of trust. For both ideas, we will reference the May 2012 paper “Understanding Risk Communication Best Practices” authored by the National Consortium for the Study of Terrorism And Responses to Terrorism (START).

The first is that maintaining the trust of the public is not only important for aiding communication about an immediate threat. The START program also discussed the public’s emotional response to risk, and concluding that, “Strong, trustworthy relationships between the warning authority and the public prior to a risk event can decrease the emotional impact of the event.” So, not only will this trust help people to hear your message, improve their self efficacy, and make better protection decisions over time, but it can also help the public to emotionally recover from the threat afterward.

[The original START paper can be found by clicking on the Resources button on the top right of the player.]

Benefits of Social Media



- “Organizations and institutions that engage publics over social media during a crisis are **better poised** than non-users to understand particular public preferences and expectations which ... can increase **positive responses to a crisis.**”

– *START program*



See the Notes and Resources tabs for more information.

The second important note regarding trust relates to knowing your audience. To know your audience it is important to be able to hear from them. What has become one of the best and most consistent ways to get feedback from your audience is to communicate with them using social media. Again hearing from the START program, the authors write that, “Organizations and institutions that engage publics over social media during a crisis are better poised than nonusers to understand particular public preferences and expectations which, when factored into ongoing communication efforts, can increase positive responses to a crisis.” This is an important reason for why social media can be an effective tool for the National Weather Service.

To preview later lessons, social media provides a great opportunity to maintain the two way discussion with the public that will allow you to get and maintain their trust as well as allowing you to maintain your knowledge of the public and their concerns. These will help you to effectively communicate with the public in a way that will help them respond positively to the crisis.

[The original START paper can be found by clicking on the Resources button on the top right of the player.]

From the options below, select help to empower the public to make decisions based on their needs.

- Know what strengthening messages make the public safer.
- Get and maintain adherence.
- Know how your audience feels about you and is affected by a risk.
- Know what ice cream flavors most people like.
- Know how your audience reacts to key messages across.
- Get and maintain trust.

Empowering the Public Interaction

Quiz - 1 question

Last Modified: May 28, 2015 at 03:55 PM

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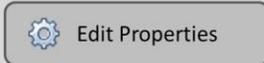
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Summary



Protective Action Decision Model

1. Availability of Information
2. Predecision processes
3. Perceptions of hazard
4. Protective action decision making
5. Behavioral response

...repeat... ...repeat... ...repeat...

To summarize, once being made aware of the potential for a threat, people go through predecision processes involving understanding the characteristics of the threat. If they understand the message, they tend to seek what further confirmation is available that the threat exists and whether it affects them. Information including environmental cues, warning information, and social cues can help increase the public's situational awareness. Those considerations, as well as what resources are available for their protection and what might inhibit those protections being taken, influence what final decision the person will make. Remember that this is an iterative process that typically occurs many times on a mostly subconscious level between the person first hearing of the threat, and deciding what action they should take. This process may only stop with the ultimate decline of the threat itself.

Summary



- Help empower the public to make decisions
 - Providing consistent & credible information will help audience act and recover
 - Know your audience
 - How they make decisions
 - How they receive communications from you
- Social media can be a useful tool in accomplishing these goals

Keep in mind that the goal is to help empower the public to take the best protective actions. Messages will be most effective when involved in a two way conversation in which consistent information is provided to the public and you communicate with them to learn how they react to various hazards. Social media platforms have emerged as a valuable tool to accomplish these goals and provide a great opportunity to earn and maintain the trust of the public. Best practices that of been learned from using social media will be discussed in upcoming lessons in this module.

Search the archive with the appropriate tags in the Predefined School System Model	
Probability of submission	Review phone notification of learning
Production process	Language course material to file
Production of reports	Production activity of the course
Production when delivery is high	Search other questions
Production system	Change what you are doing

SM Risk Assessment Quiz

Quiz - 6 questions

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 Edit in Quizmaker

 Edit Properties

Please complete this quiz to assess your learning of the material. When you have passed the quiz, click “Finish” to move on with the course.

Upcoming Lessons

1. Risk Assessment
2. Risk Communication
3. Social Media: Routine Operations
4. Social Media: Significant Events

As stated at the beginning of this lesson, this is the first of four lessons in this module. The next lesson is about risk communication, which takes advantage of the material we just covered. Then, we will get into social media more explicitly.