Making the Call:

Climate Risk Decision-Making in the Field



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Agenda

- Framing the problem
- Decision making frameworks
- Influencing factors
- Building a seasonal profile
- Case studies and breakouts
- Action steps/takeaways





A drone view shows mud covering properties after the flash flood in Trishuli, Nepal.
Photograph: Navesh Chitrakar/Reuters

Climate driven hazards are increasing in intensity, severity, and unpredictability

Record heat waves, rains, severe floods, years-long droughts, extreme wildfires, and widespread flooding during hurricanes are all becoming more frequent and more intense.



Traditional preparedness models can fall short in dynamic field conditions.

Field leaders need a process for continually reassessing risk rather than simply following a predetermined plan.

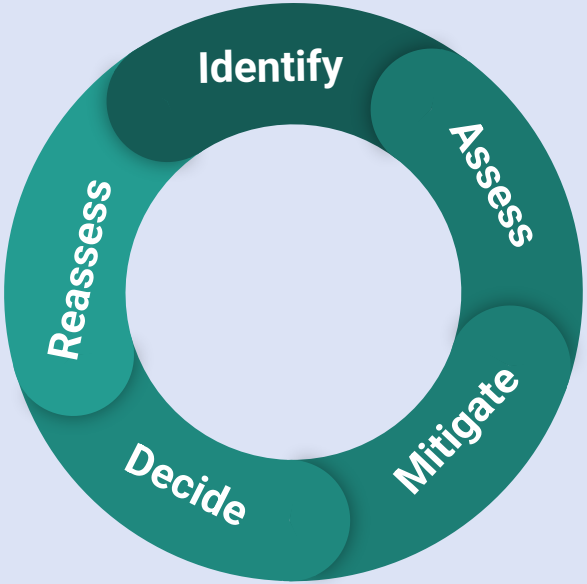
900 students saved by evacuating them to higher ground.

The principal took real time information and adjusted his plan accordingly.

Practical Decision Making Frameworks

- Dynamic risk assessment cycle
  - Identify → assess → mitigate → decide → reassess
- Decision thresholds & trigger points
  - Go/no-go protocols, modify, evacuate
  - ACE AQI Decision Sheet
- Good decision vs. good outcome distinction

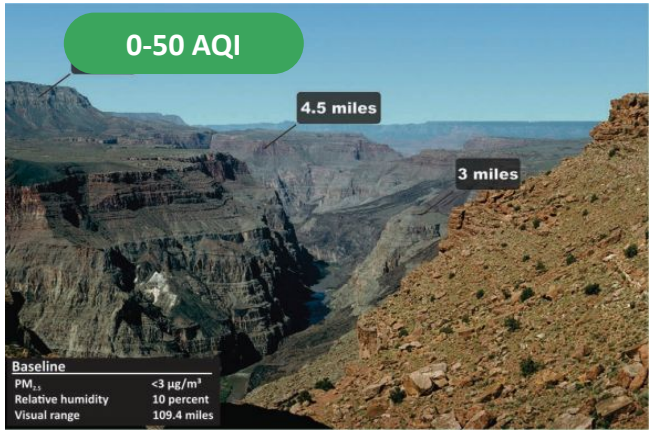
Dynamic Risk Assessment Cycle
Originated by UK Fire & Rescue Service

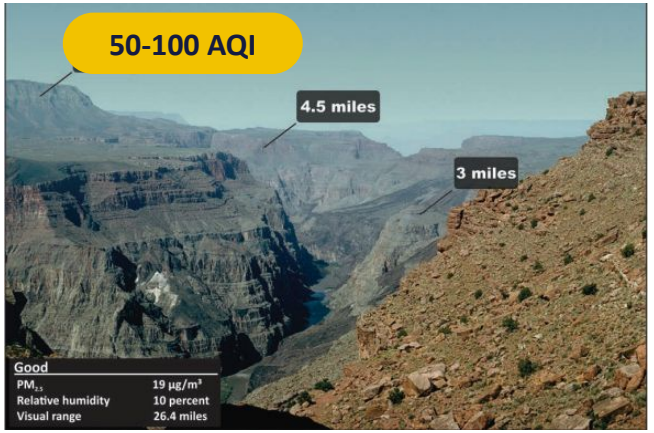


AQI FIELD DECISION MAKING CHEAT SHEET

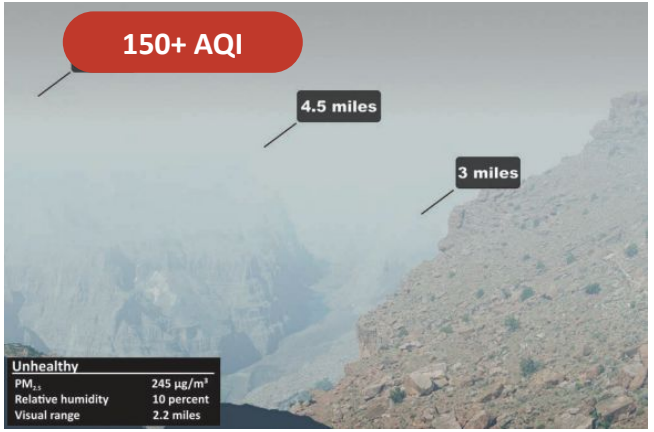
Air Quality Index AQI & PM 2.5	Who Needs to be Concerned?	What Should I do?
Good (AQI 0 - 50) (PM 2.5 - < 20)	Nobody	Enjoy the day.
Moderate (AQI 51 - 100) (PM 2.5 21 - 40)	Some people who may be unusually sensitive to particle pollution.	**Unusually sensitive people:** Consider reducing prolonged or heavy exertion. Watch for symptoms such as coughing or shortness of breath. These are signs to take it easier. **Everyone else:** No changes.
Unhealthy for Sensitive Groups (AQI 101 - 150) (PM 2.5 41 - 60)	Sensitive groups include people with heart or lung disease, older adults, children and teenagers.	**Sensitive groups:** Reduce prolonged or heavy exertion. It's OK to be active outside, but take more breaks and do less intense activities. Watch for symptoms such as coughing or shortness of breath. People with asthma should follow their asthma action plans and keep quick relief medicine handy.
Unhealthy (AQI 151 - 200) (PM 2.5 61 - 150)	Everyone	**Sensitive groups:** Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a less impacted area. **Everyone else:** Reduce prolonged or heavy exertion. Take more breaks during outdoor activities, at least one 5 minute break per hour*. Notify Division leadership of hazard.
Very Unhealthy (AQI 201 - 300) (PM 2.5 151 - 250)	Everyone	**Sensitive groups:** Limit field operations, rescheduling to less impacted areas where possible. **Everyone else:** Limit prolonged or heavy exertion. Take more frequent breaks, at least two 5 minute breaks per hour*. Seek filtered air indoors during breaks and at the end of work day when possible. Consider wearing a particle filtering dust mask.Notify Division leadership of hazard.
Hazardous (AQI > 300) (PM 2.5 > 250)	Everyone	**Everyone:** Field operations should be suspended when AQI exceeds 300. Consult with Division leadership for authorization and to discuss alternative work options.

Grand Canyon National Park
(Arizona)









Source: Smoke Management Photographic Guide: A Visual Aid for Communicating Impacts - USFS

Factors Influencing Decision Making



Environmental

- AQI
- Weather
- Temperatures
- Terrain



Human factors

- Fatigue
- Group dynamics
- Experience



Organizational constraints

- Policies
- Communication systems

Building a Seasonal Profile

Map the hazards in each of your program locations.

	Winter	Spring	Summer	Fall
Wildfire / Smoke	Low	Emerging	**High**	**High**
Flood / Flash Flood	Moderate	**High**	Variable	Moderate
Extreme Heat	Low	Moderate	**High**	Moderate
Severe Storms	Moderate	**High**	**High**	Moderate
Winter Weather	**High**	Moderate	Low	Emerging

Then ask: What should we monitor? What can we mitigate ahead of time? What would trigger action? Who makes the call?

Scenario: Flash Flood in a Remote Setting

You are the lead guide for a 12-person backcountry river trip (10 participants, 2 staff). It's Day 3 of a 6 day trip. You are camped along a river in a designated backcountry site. It's a clear afternoon. The river is low and calm and approximately 50 feet from tents. It has been a long day and several participants are tired.



Scenario: Flash Flood in a Remote Setting

5 pm Forecast:

Scattered evening thunderstorms, flood watch, no flood warning.
Note: There have been flood watches for 18 of the past 21 days for this area.

5 pm Real time:

- There is higher ground for camping about a 15 minute walk from camp.
- Cell service is intermittent but you have an InReach device.
- It's currently sunny.



Scenario: Flash Flood in a Remote Setting

Identify → Assess → Mitigate → Decide → Reassess

- What are the potential hazards?
- What mitigations could you put in place if you stay?

- What would be your trigger for moving?
- Do you move now, prepare to move, or stay?



Scenario: Flash Flooding in Remote Settings continued

6:25 pm Forecast:

A storm system is producing heavy rainfall upstream.

6:25 Real time:

- It’s not raining at your campsite.
- The river is moving faster.
- The water is muddier with small debris.
- It is getting dark.

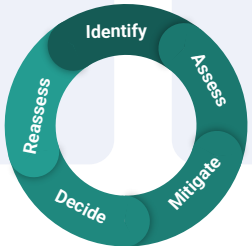


Scenario: Flash Flooding in Remote Settings continued

Identify → Assess → Mitigate → Decide → Reassess

- Do you evacuate the campsite now?
- Do you move people first and leave some gear behind?

- What information do you communicate to the group?
- If you move, how do you prevent a rushed evacuation from creating additional hazards?



Scenario: Flash Flooding in Remote Settings continued

7:30 Real time

- It just started raining and the water is rising rapidly.
- You can hear a loud roar from upstream.
- Moving now means hiking uphill on a wet, unfamiliar trail in near dark.

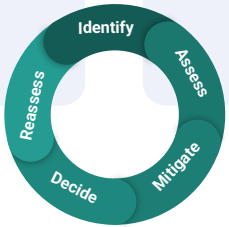


Scenario: Flash Flooding in Remote Settings continued

Identify → Assess → Mitigate → Decide → Reassess

- What are your options now?
- What are the risks of each option?
- If you had decided to move earlier, how would your options have been different?

- Are you now making the **least risky decision—or simply reacting to fewer remaining options?**



Scenario- Extreme Heat & Program Modifications

You are leading a 7-person conservation crew that is working on a remote trail project for an 8 day hitch. The crew is about a 4 hour drive from the nearest town, a 5 hour hike from the project vehicle and a 1 hour hike from their campsite which is at the edge of a small lake. The project was planned several months ago. The forecast calls for a highs of 88°- 94F for the week, and the crew's written work plan includes regular water and rest breaks.

The crew starts work at 7:00 a.m. By 10:30 a.m., the temperature is already 86°F. It is sunny, humid, and there is very little shade at the worksite.

Scenario- Extreme Heat & Program Modifications

At 10:45: One member reports a headache and nausea and asks to stop work and sit in the shade.

Another member has become noticeably quieter and is making some unusual mistakes with their tools.

Everyone has been drinking water, but you notice that several members are sweating heavily.

The crew has completed about 30% of the day's planned work. The afternoon forecast now calls for 96°F, with higher humidity than originally predicted.

Scenario- Extreme Heat & Program Modifications

Identify → Assess → Mitigate → Decide → Reassess

- What are the hazards?
- How serious are the risks?

- What can you do to mitigate them?
- Do you continue, modify, or stop the work?



Scenario- Extreme Heat & Program Modifications

New information:

The member who reported the headache and nausea rests and sits in the shade, drinks some fluids, and says an hour later that they feel much better and want to return to work.

The other member says, “*I'm just tired. I've worked in heat like this before.*”

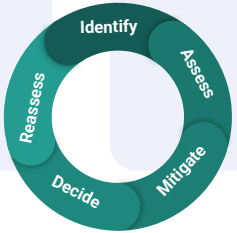
The project partner is hiking in later that day to assess the work that the crew has done.

Scenario- Extreme Heat & Program Modifications

Identify → Assess → Mitigate → Decide → Reassess

- Does improvement mean the risk has gone away?
- Does member willingness to continue factor into your decision?
- Would you modify the work/rest schedule?
- Would you change the type of work?

- Would you move the crew?
- Would you establish a specific threshold for stopping?
- Who has the authority to make that call?



Scenario- Extreme Heat & Program Modifications

Additional questions:

Imagine the crew decides to continue. Everyone finishes the project without anyone becoming seriously ill. Was continuing the right decision?

And conversely: Imagine the crew stops work at 11:00, but it turns out to be a relatively mild afternoon and everyone would have been fine. Was stopping the wrong decision?

Scenario - Wildfire & Evacuation Decisions

A wilderness camp for teens in northern Minnesota has a base camp (headquarters for staff, logistics, meals, outfitting, and communications) in operation in an area being affected by active wildfires. Local emergency management use a Ready–Set–Go evacuation framework, and the camp is placed on “Set” status, meaning conditions have escalated and the camp should be prepared to evacuate.

Camp leadership must decide whether to evacuate the camp and how to manage multiple groups already in the field as well as upcoming trips.

Scenario - Wildfire & Evacuation Decisions

At the time:

- 2 groups directly affected by the fires underwent an emergency evacuation by the USFS and local outfitters, having to leave almost all their gear, canoes and most personal belongings behind as an active fire was threatening them.
- Numerous camper groups are currently in the field in multiple locations around North America in locations completely unaffected by the wildfires. including the western U.S. mountains, Alaska, and northern Canada.
- A new group of 50+ campers is scheduled to arrive at the camp in the coming days to begin their trips.
- 16 groups of campers currently in the field are scheduled to return to the base camp within the next few days.
- Wildfire conditions and the potential for further evacuation orders are not static. AQI is fluctuating, winds are shifting, and fire behavior is active.

Scenario - Wildfire & Evacuation Decisions cont.

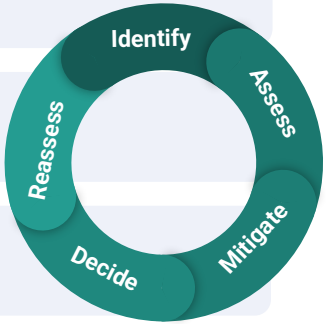
Questions/Considerations:

Immediate Field Operations - Managing people currently in harm's way and those returning to Base Camp

Decision Point 1A - Evacuation Triggers (Stay, Relocate, Close)

Decision Point 1B - Rerouting Returning Groups

Decision Point 1C - Communication Protocol



Identify → Assess → Mitigate → Decide → Reassess

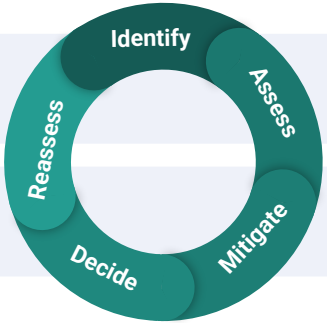
Scenario - Wildfire & Evacuation Decisions cont.

Questions/Considerations:

Air Quality & Health Thresholds (Stay, Close, Relocate) - Managing groups and staff at base camp and near the region.

Decision Point 2A - AQI & Exposure

Decision Point 2B - Resource Divergence



Identify → Assess → Mitigate → Decide → Reassess

Scenario - Wildfire & Evacuation Decisions cont.

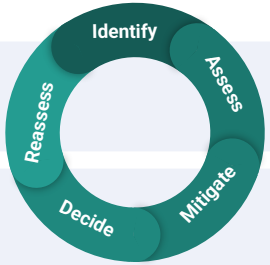
Considerations:

Organizational Impacts & Business Continuity (Incoming Groups & “Distant” Groups)

Decision Point 3A - Incoming Groups

Decision Point 3B - Family Communications

Decision Point 3C - Bandwidth and Risk to “Distant” Trips



Identify → Assess → Mitigate → Decide → Reassess

Scenario - Wildfire & Evacuation Decisions

The camp decided to **cancel the upcoming session and evacuate the base camp** rather than wait for a mandatory evacuation order. Campers returning from the field were met at locations outside the affected area and transported home rather than returning to camp.

After approximately one week, the camp found an alternate base location, moved gear, and was able to resume operations from the **new temporary base location**. Upcoming trips scheduled for the wildfire area were rerouted to areas outside the wildfire-affected region, allowing the program to continue while reducing exposure to the ongoing wildfire risk.

Synthesis: From Scenarios to Practice

Commonalities across all cases:

- Decision-making under incomplete information
- Importance of pre-defined thresholds
- Clear decision-making authority at the point of action
- AARs or Debriefs for organizational learning

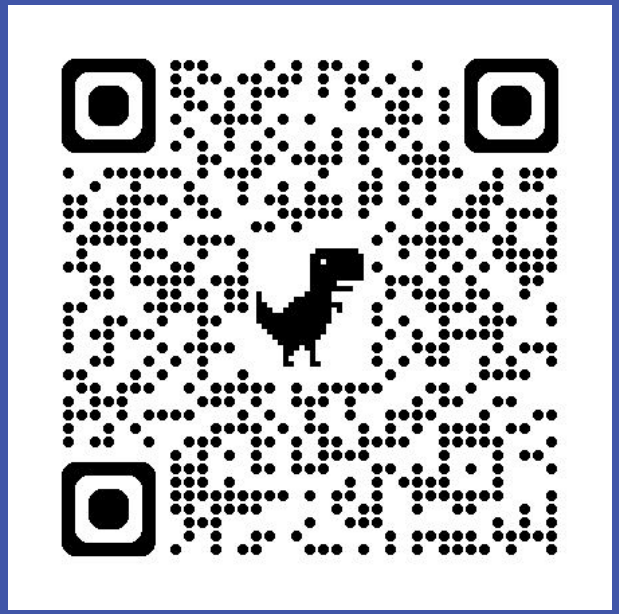
Action Steps & Takeaways

1. **Develop a Decision Toolbox:** Make sure your organization has built decision thresholds & trigger points, seasonal profiles, as well as the ability and trust to make dynamic risk assessments in the field.

2. **Practice Incident Drills:** Walk through scenarios, like the ones we walked through today with your team on a regular basis to test your readiness.

3. **Implement After-Action Reviews or Debriefs:** After near-misses and incidents, develop an after-action report process to evaluate decisions, document lessons learned, and update policies and staff training.

Contact us:



Access our presentation

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