



# God Willing and the Creek Don't Rise: Medical School Community Aides in Flood Relief Effort

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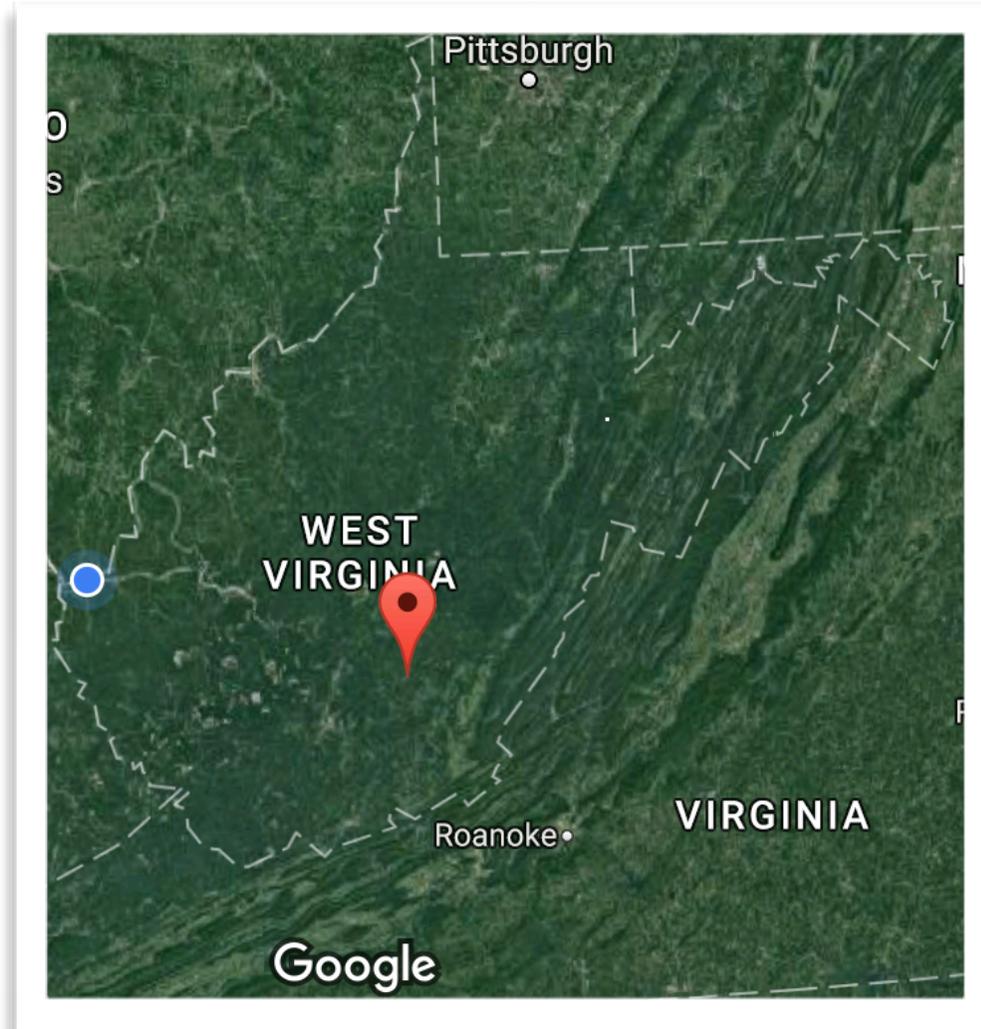
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# Objectives

- Understand basic concepts in disaster relief preparation.
- Understand common clinical conditions associated with flooding.
- List barriers to providing assistance in both foreign and domestic settings.

# West Virginia



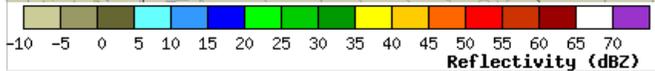
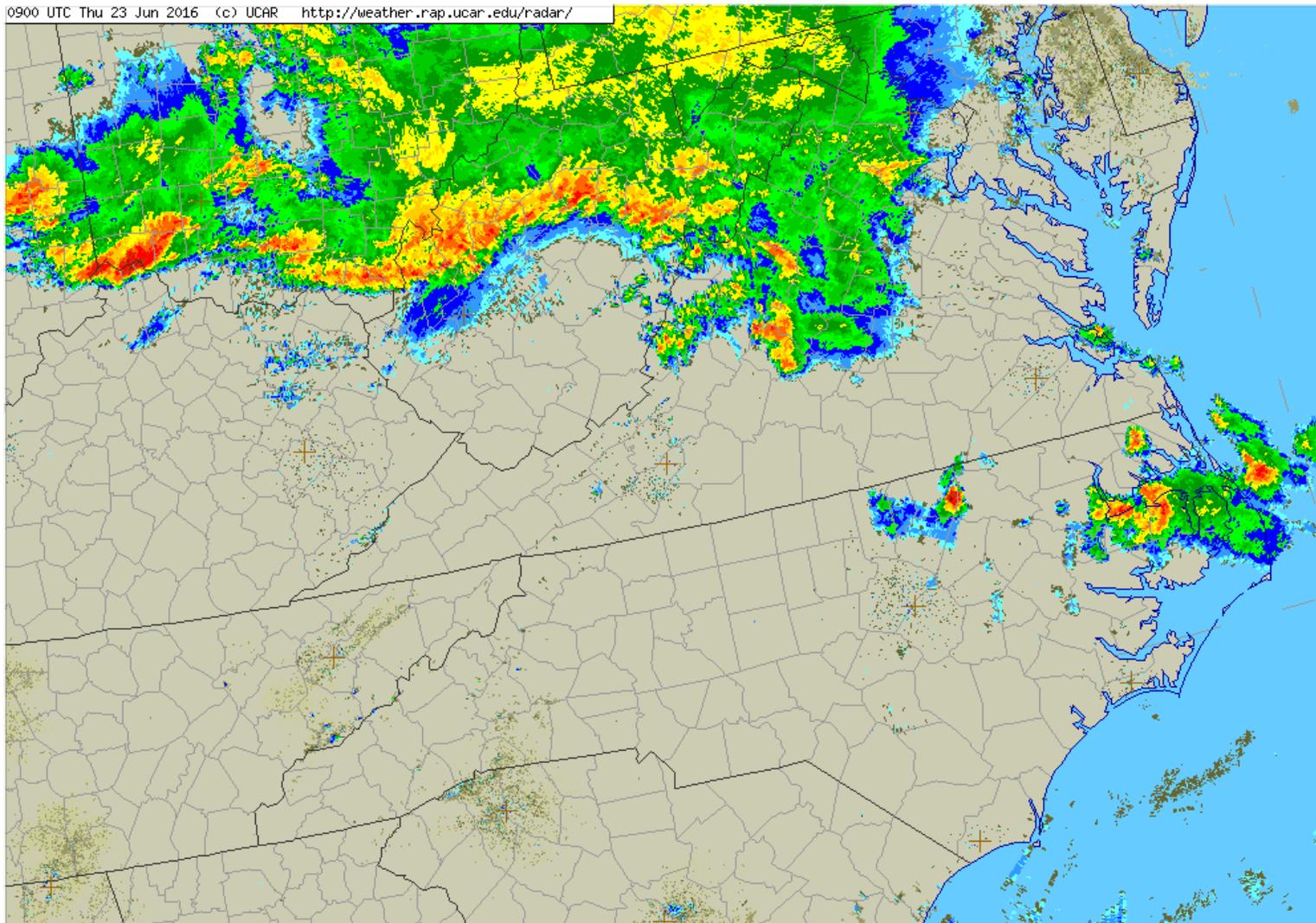
Imagery@2017/Landsat/Copernicus, Data SIO, NOAA, U.S. Navy, NGA, GEBCO, Map data@2017 Google

# June 23, 2016

- Approximately 8-10” fell within a 12 hour period in Greenbrier, Co WV.
- Classified as a 1 in 1,000 Year Flood
  - Series of thunderstorms known as a “train”
- Record rainfall fills populated hollows and low land between mountains.
- 44 out of 55 counties declare State of Emergency
- Many people missing, 23 later confirmed dead

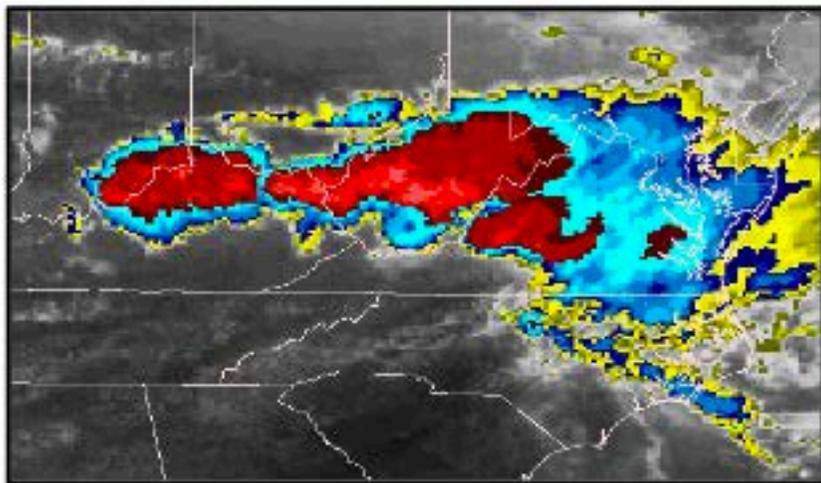
(Rice; National Weather Service)

0900 UTC Thu 23 Jun 2016 (c) UCAR <http://weather.rap.ucar.edu/radar/>

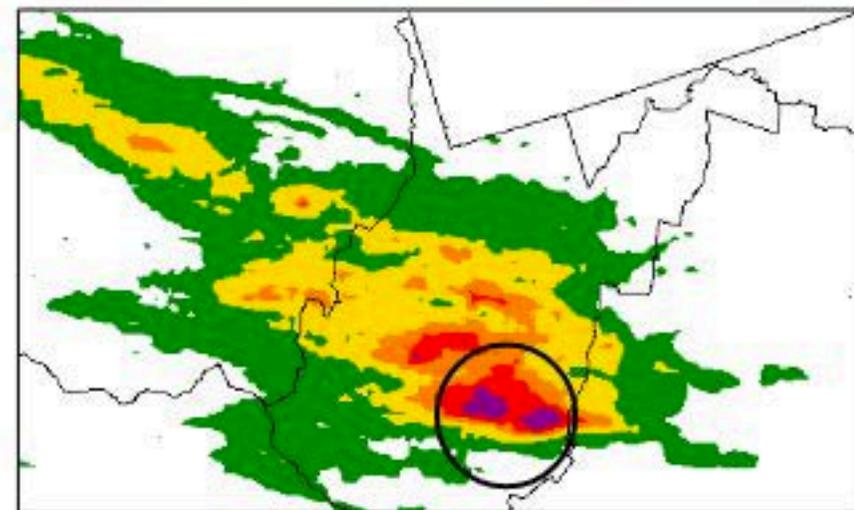


(National Weather Service)

[https://www.weather.gov/images/rnk/pastevents/2016\\_06\\_23\\_Flood/RadarMosaic\\_loop\\_fast.gif](https://www.weather.gov/images/rnk/pastevents/2016_06_23_Flood/RadarMosaic_loop_fast.gif)



(National Weather Service)



24h Observed Rainfall Exceeded  
100-year Recurrence Interval



(Greenbrier Emergency Management via NWS)

# Close to Home

“Water rose so quickly out of stream banks that people didn’t have time to leave their homes, move their cars, or grab valuables or medications. By Friday morning, I couldn’t leave my house because all routes were under water. ”

-Kimberly Becker, MD. AAFP Fresh Perspectives Blog

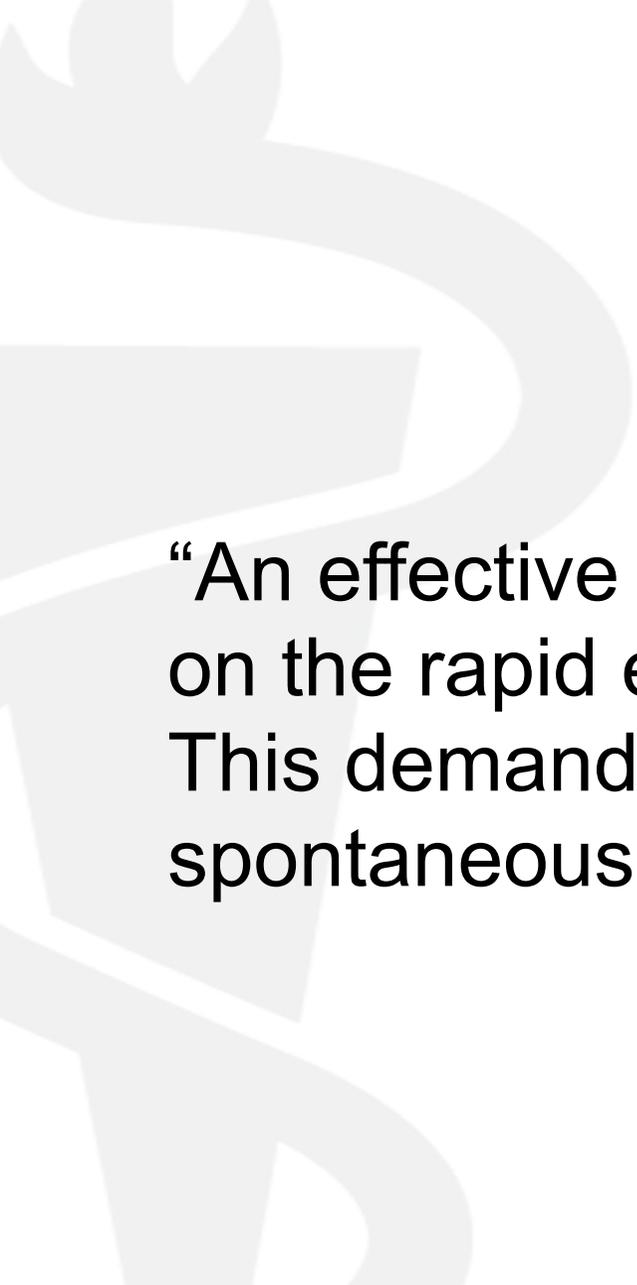
# Close to Home

“When I managed to find her (her patient), she was disoriented and dehydrated because floodwater had breached her trailer, knocked over her refrigerator, and prevented her from accessing her insulin.”

-Kimberly Becker, MD. AAFP Fresh Perspectives Blog



**What now?**



“An effective initial response to a major catastrophe depends on the rapid execution of well-prepared contingency plans. This demand generally presents a significant challenge to spontaneous volunteerism” (Merchant et.al).

# Phases of Emergency Management

- Mitigation - Actions to reduce the probability of disasters and lessen their impact.
- Preparation - Action plans which may be implemented during a disaster.
- Response - Provide emergency assistance following a disaster.
- Recovery - Restoration of community to pre-disaster state.

(National Governors' Association)

# Mitigation and Preparation

- Often best to partner with an organization adept in disaster response.
- Governmental versus non-governmental organizations.
- Domestic versus foreign.

(Merchant et.al)

# Volunteer Organizations

- Governmental Organizations
  - Department of Health and Human Services
    - Emergency System for Advance Registration of Volunteer Health Professionals ([ESAR-VHP](#))
    - Medical Reserve Corps ([MRC](#))
    - National Disaster Medical System ([NDMS](#))
- Non-Governmental Organizations
  - National Voluntary Organizations Active in Disaster ([NVOAD](#))
  - World Health Organization ([WHO](#))

(Merchant et.al)

# Other resources for mitigation/preparation

- AAFP Resources
  - Manuals on Personal, Professional, and Community Preparedness ([AAFP Disaster Preparedness](#)).
- Disaster Training Courses
  - American Red Cross ([Red Cross](#))
  - Federal Emergency Management Agency ([FEMA](#))

(Merchant et.al)

# Flooding - Response Phase

- Consider: What are the needs of those being served and how may I meet them?
- Search and rescue
- Loss of infrastructure/poor sanitation
  - Loss of water, food, agriculture.
- Common medical conditions
  - Drowning
  - Fracture/Laceration
  - Skin Infection
  - Vector-Borne Disease
  - Fecal-Oral Pathogens

(Auerbach et.al)

# Flooding - Recovery Phase

- While awaiting return of infrastructure, support of local health care providers/communities often needed.
  - Chronic disease management
  - Immunizations
- Psycho-social implications
  - Community/Families deal with devastation and loss.
  - Increased risk of psychological distress, anxiety, and depression.

(Auerbach et.al)

# Additional Considerations Prior to Volunteering

- What are my needs prior to serving and how may I meet them?
  - Lack of Infrastructure
  - Security
  - Climate
  - Personal Medical Conditions
  - Vaccinations
  - Travel Arrangements
  - Emotionally

(Merchant et.al)



# Marshall Medical Outreach

# Marshall Medical Outreach

- Began in February 2011 to address the needs of the community of Huntington, WV
- Led by Charles Clements II, MD
- Run by medical students
- Organize 1 “Outreach Event” per month
- Medical + Ophthalmological + Dermatological + Psychological + Preventative Care

# Marshall Medical Outreach



# Call for Assistance



(Photograph by Jerome A. Gilbert)

# Our Approach to Disaster Relief

- Do No Harm
- Understand the Area Affected
  - Barriers
    - Road Access
    - Electricity
    - Sanitation
  - Assessment
- Understand the Need
- Plan Your Aid Strategy
  - Site
  - Supplies
  - Personnel
  - Lodging/Personnel Needs

# Clinical Conditions Associated with Flooding

- Acute
  - Fractures
  - Lacerations
  - Loss of Chronic Medications
- Sub Acute
  - URI
  - Diarrhea
  - Loss of Chronic Medications
  - Loss of Medical Support
- Chronic
  - Tetanus
  - URI
  - Cellulitis
  - Bites

(Ahmad, Rashidi, et.al)

# Exit Strategy



# Reflections





# Questions? / Discussion

# Special Thanks

- American Academy of Family Physicians
- Marshall University Department of Family and Community Health
- Marshall Family Medicine Residency Program
  - Twitter [@MU\\_FM](https://twitter.com/MU_FM)

# Resources

- Ahmad, Rashidi, et al. “Health Major Incident: The Experiences of Mobile Medical Team during Major Flood.” *Malaysian Journal of Medical Sciences*, vol. 15, no. 2, Apr. 2008, pp. 29–33. *PubMed*, [www.ncbi.nlm.nih.gov/pmc/articles/PMC3341890/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3341890/).
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