



Extreme Weather Conditions – Stormwater Quality and Quantity

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CENTER

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THINK FUTURE.

MUSTBE EVENT, PORI 2.10.2024



| Merilogistiikan tutkimuskeskus

Introduction to extreme weather

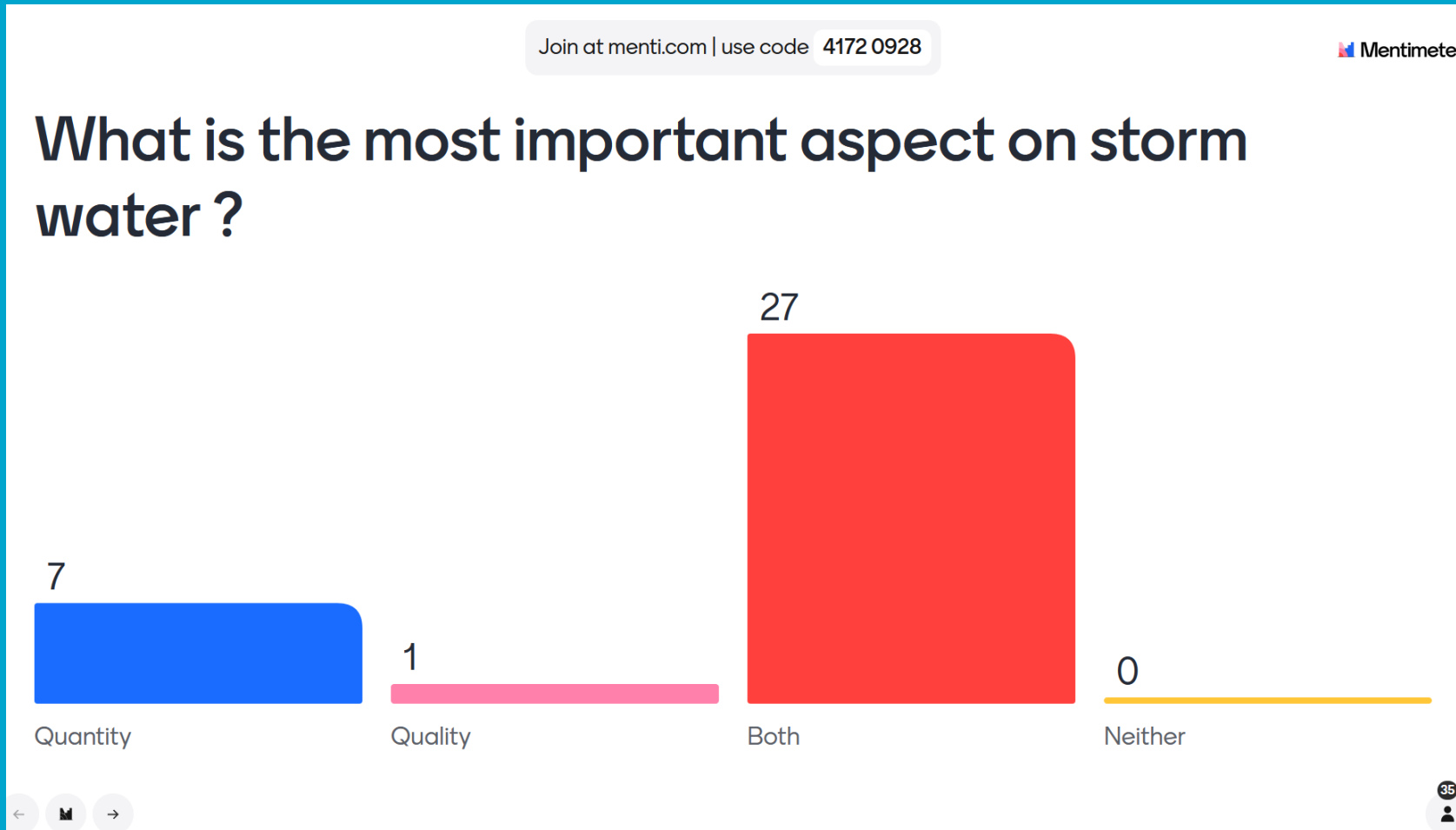
- Impact of climate change on weather patterns
- Types of extreme events affecting stormwater: heavy rainfall, floods, and storm surges



Compound event and multi-hazard terminology

Brett et al. 2024 (submitted)

MENTI1 www.menti.com, code 4172 0928



Stormwater quality: Key challenges

- Contaminant transport during heavy rainfall
- Increased runoff pollution: nutrients, heavy metals, microplastics...



An aerial photograph of a large, powerful wave crashing onto a sandy beach. The water is a deep, vibrant blue-green color, and the white foam of the wave is prominent. The sky is filled with soft, golden light from the setting or rising sun, creating a dramatic and serene atmosphere. The horizon line is visible in the distance, separating the sea from the sky.

Stormwater quantity: managing surges

- **Storm Surges:** Rapid rises in sea level during storms due to high winds and low atmospheric pressure.
- **Flood Surges:** Sudden increases in river or coastal water levels due to heavy rain or upstream flow.
- **Tidal Surges:** Large water movements during extreme tides, often exacerbated by weather conditions.

-> Flood risk from increased runoff volumes

-> Overloading of drainage systems and infrastructure



Effects on urban and coastal areas

- Vulnerabilities in urbanized watersheds
- Impact on coastal and marine environments
- <https://www.dw.com/en/torrential-rain-floods-wreak-havoc-in-central-europe/g-70230432>
- Impact databases
<http://damocles.compoundevents.org/upload/DAMOCL-ES%20WG3.pdf>

Innovative solutions for stormwater management

- Nature-based solutions: green infrastructure and wetlands
- Engineering solutions: smart drainage systems and flood barriers
- Monitoring and predicting stormwater impacts:
Use of technology: Remote Sensing, IoT, and data analytics
Early warning systems and decision support tools



Pori pilot sites



Future outlook: Adaptation and resilience

- Building climate resilience in urban planning
- Policies and strategies for sustainable stormwater management
- Awareness raising and communication

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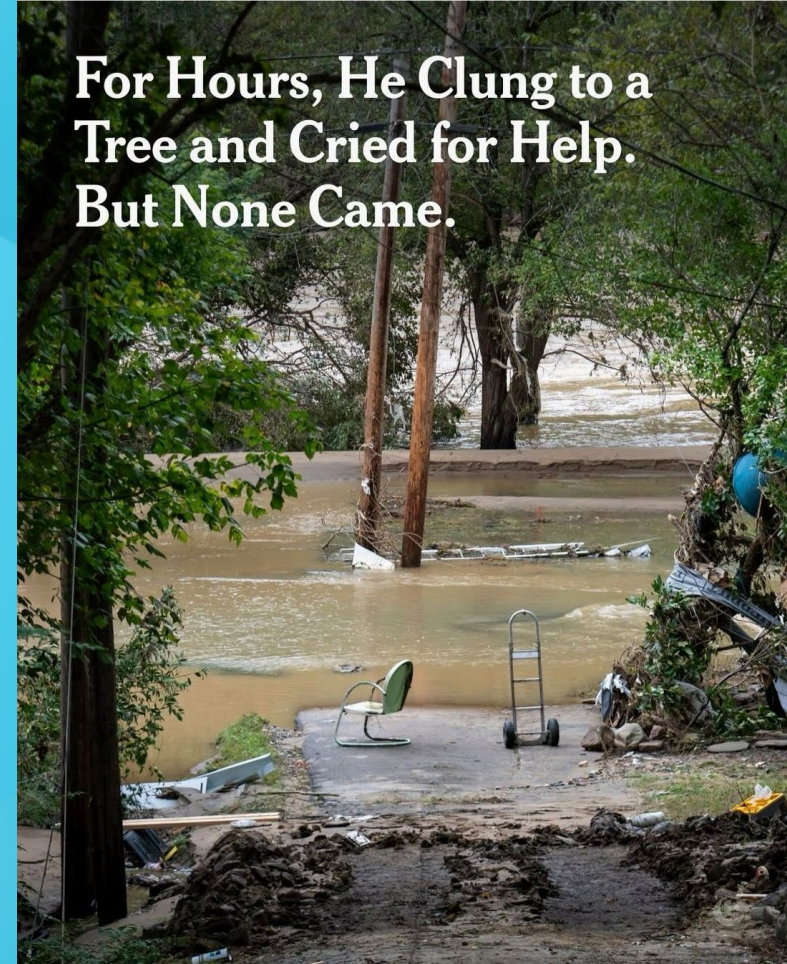


nytimes

Marshall, North Carolina



For Hours, He Clung to a Tree and Cried for Help. But None Came.



4 349

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nytimes Bruce Tipton, a 75-year-old Navy veteran, refused to evacuate his trailer home on a low-lying plot of land in Marshall, North Carolina, as flooding from Tropical Storm Helene caused the nearby French Broad River to rise.