

iOS Duo Library Research

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Introduction

Weather apps are a great tool to keep people informed about upcoming weather changes. Based on them they can prepare for their journey and what to wear beforehand. In addition to providing information about upcoming weather changes, weather apps can also help people plan their daily activities, such as deciding whether to go for a walk or stay indoors. They can also include alerts for severe weather conditions such as thunderstorms or hurricanes which can help people take necessary precautions to stay safe.

Moreover, weather apps can provide detailed information about temperature, humidity, wind speed, and other factors, which can be particularly helpful. There are a lot of apps that contain these types of features and millions of people are using them daily. This indicates that they rely on them and are an essential part of their daily routine.

The aim of this document is to highlight different statistics and answer these questions:

- What is considered heavy rainfall in terms of intensity?
- How is rainfall intensity measured, and what instruments are used?
- What factors determine how quickly a person becomes wet in the rain?
- What are some effective strategies for staying dry in the rain?
- What is the effect of rain on people?
- How do people experience different mm of rain?
- What are the best materials for rain gear to keep cyclists dry during rainy weather?

Instruments to determine rain



Instruments for measuring precipitation include rain gauges and snow gauges, and various types are manufactured according to the purpose at hand. The rain gauge is also known as an udometer, pluviometer, or an ombrometer. To measure the rain, rain gauges must be placed in an area where there are no obstacles to obstruct the rain, so an accurate reading can be obtained. There are different types of rain gauges such as graduated cylinders, weighing bucket gauges, tipping bucket gauges, and simply buried pit collectors.

The Australian governments' standard instrument for the measurement of rainfall is the 203mm rain gauge. It is basically a circular funnel with a diameter of 203mm which collects the rain into a graduated and calibrated cylinder. The measuring cylinder can record up to 25mm of precipitation. Any excess precipitation is captured in the outer metal cylinder.

In any case the instrument captures the rainfall and is read after an amount of time to determine the mm of rain that have fallen. More sophisticated instruments will measure the depth electronically and then operate a valve to dump it. For more accuracy a funnel can be attached with ten times the area of the cylinder cross section and then one will have ten times the reading for more accurate gauge of small amounts of rainfall.

Rain measurements

Mathematically speaking, 1mm of rain equals 1 liter of water falling on a square meter of surface.

< 1 mm/hour

is a light drizzle that is safe to go out in. You will remain mostly dry even without a jacket. However, due to the unpredictability of Dutch weather it is a good idea to take one

1 - 2 mm/hour

is the average Dutch rain. It is still safe to go out in, but make sure to take a jacket and/or umbrella

3 - 5mm/hour

tends to go to the heavier side of the rain. Going out is only recommended with dedicated protective equipment

5 - 10mm/hour

is a very heavy rain. You will most definitely be wet/sick even if you use protective clothing. Going out is not recommended

10-20mm/hour

a storm that is usually coupled with strong winds. Going out is not recommended. Stay inside until the weather settles down.

> 20mm/hour

a strong storm. Stay inside at all costs, otherwise you can seriously hurt

Types of rain

1. Convectional rainfall

It occurs when the earth's surface becomes more heated than its surroundings. Convectional rainfall happens in an unstable or moist atmosphere. This type of rainfall results in convective clouds. As the air rises, it cools and condenses, releasing precipitation in the form of rain.

- Occurs in equatorial regions
- Heavy with lightning or thunders
- Does not last long and occurs in the summer
- The most common rainfall type
- Range of 10-30 mm per hour

2. Orographic or relief rainfall

Relief rainfall occurs when moist air is lifted near a mountain range. The moist air goes over the mountain range. As it moves further, the air cools down. Due to this orographic clouds are formed which are the source of the rainfall.

- Causes floods and hurricanes
- Uncontrollable, persistent as it falls rapidly
- Lead to flash floods and landslides
- A few mm to 100 mm per hour

3. Frontal rainfall

Occurs due to cyclonic activity. It moves clockwise in the southern hemisphere and anticlockwise in the northern hemisphere. Occurs when warm air and cool air meet each other.

- Leads to the formation of clouds and rainfall
- Widespread and persistent, covering a large area
- Ranging from 1-10 mm per hour
- Relatively light and steady



Types of weather protection

1

Shell (Rain Jacket)

They are typically made from a lightweight, breathable fabric that is treated with a waterproof coating or membrane to repel rain and moisture. They provide a protective outer layer and are easy to carry.

2

Poncho

It is typically made from a lightweight, waterproof material such as nylon or polyester. They are likely to rip as you walk along narrow trails, with brush and branches on each side. Designed to be worn over other clothing,

3

Gaiters

Simply a covering for your legs and boots that are designed to protect your legs from inclement weather. They are typically made from a lightweight and durable material such as nylon or Gore-Tex

4

Pack Cover

It is made of a fabric that will become waterlogged within minutes of strong rain. It is used mainly to protect your bag while traveling.

Breathable:

Keeps rain from getting through to your skin, while also moving sweat back through to the outside world.

Water-resistant:

Also breathable, this is gear that can handle light rain for a brief time - windbreakers and featherweight jackets.

Nonbreathable:

For example - poncho. If you simply need to keep the rain out while sitting or standing around, this gear does just fine and costs very little money.

Windproof

Any waterproof jacket is also windproof. That makes sense when you consider that a barrier designed to block driving rain would also block the wind that's pushing the rain.



Effect of rain on people

Rain has both physical and mental effect on people

Physical effect of rain

When a person is exposed to rain they become wet and therefore cold. A problem arises when they stay wet for too long, because this means they are also cold, which could lead to sickness. If the rain is strong and coupled with wind, it can be falling against one's face, which makes it very hard to see and navigate.

Heavy rainfall can also lead to different hazards, for example: flooding, damage to buildings and infrastructure, and loss of crops and livestock. It is also very dangerous for drivers in heavy rain, which makes the road slippery and reduces visibility, potentially leading to a lethal accident.

Mental effect of rain

Rainy days are most often known to induce depression and sadness in humans. This is accounted to the decrease in serotonin levels caused by lack of sunshine. This also contributes to food cravings for comfort foods and carbohydrates because they boost serotonin levels. However, this is only temporary and not an effective way to combat depression symptoms.

Another reason for decreased mental health is the lack of sunshine. That's because human body rely on sunlight to keep their internal clock in check, which regulates the sleep cycle. Light makes people feel alert, so when it's raining for days, one might start to feel drowsy. This can mess with normal sleep patterns, causing snoozing more or less than usual and disrupting the quality of sleep.

Strategies for staying dry

SUITABLE CLOTHES

Invest in a high-quality rain jacket and pants made from waterproof or water-resistant materials. Choose items that are breathable to prevent sweating and discomfort.

UMBRELLA

A good quality umbrella can help keep you dry and protect your hair and face from raindrops. Choose an umbrella that is large enough to cover your upper body

TIMING IS KEY

Check the weather forecast and try to plan your activities for when rain is less likely. If possible, wait for a break in the rain before heading out.

WATERPROOF SHOES

Look for footwear that is specifically designed for wet conditions, with waterproof materials and non-slip soles to prevent slipping on wet surfaces.

PLAN YOUR ROAD

Avoid areas that are prone to flooding or standing water. Try to take routes with good drainage.

LAYER UP

Consider layering your clothing to keep warm and dry. Choose moisture-wicking fabrics that will keep you dry even if you do get wet.

Competitor Analysis

ACCUWEATHER

AccuWeather is a popular weather forecasting service that provides up-to-date weather information for locations all over the world. The service offers a wide range of features and tools to help users stay informed about current and upcoming weather conditions.

Pros

- Highly accurate and reliable
- Available on multiple platforms
- Trusted by millions
- Provides detailed information about rain/wind/hurricanes

Cons

- Limited free version
- Inaccurate forecasts sometimes
- Cluttering UI
- Too many advertisements in the app and website

Conclusion: AccuWeather is used by millions of people around the world but people have reported that sometimes it gives them inaccurate information and it can be misleading. The app provides a lot of information, statistics and forecast predictions and the UI is becoming too much, becoming hard to navigate and understand. The free version is limited and users cannot see the weather for certain countries as they have to pay.

DARK SKY

A popular weather app that provides hyperlocal weather information and forecasting. It offers real-time weather updates and minute-by-minute forecasts for up to an hour in advance. Recently Apple bought it and the app will be deleted in the end of March 31, 2023

Pros

- Uses GPS to provide highly accurate, location-specific weather data
- Minute-by-Minute Forecasts
- Weather Alerts

Cons

- Limited Geographic Coverage
- Subscription Fee
- Limited Features

Conclusion: Users have been using Dark Sky for some time but immediately after Apple bought it they are experiencing some limitations. Beforehand, the app was completely free but now it has become paid and has limited features. The app was very good when it comes to location-specific weather data.

Competitor Analysis

DROPS

A visually stunning weather app that provides users with accurate weather forecasts and information in a unique and engaging format. It gives the users statistics and up-to-date information about upcoming rain. Also, it has satellites that show the clouds at any given point.

Pros

- Beautiful visuals
- Free to use
- Accurate weather data
- Hourly and daily forecasts

Cons

- Limited geographic coverage
- No widget available
- Slow loading times

Conclusion: the app Drops provides the users with different statistics for the upcoming weather. It also sends alerts but the app has a very limited geographical coverage. It works perfectly fine in the Netherlands but when it comes to Bulgaria (not so much). The app recently included 24 hour forecast which was missing in the previous version.

BUIENRADAR

Buienradar is a popular weather app that provides detailed and up-to-date weather information for locations in the Netherlands and some other parts of Europe.

Pros

- Radar and satellite maps
- Accurate weather data
- Notifications and alerts
- Widget

Cons

- Limited geographic coverage
- Dutch language only
- Limited features
- Battery consumption

Conclusion: Buienradar provides very detailed information about upcoming rain, temperature changes, daily forecasts but it only provides weather information for locations in the Netherlands and some other parts of Europe. If people are outside of this coverage area, the app may not be very useful for them. The app is primarily in Dutch language, which may be a drawback for non-Dutch speakers who want to use the app.

Conclusion



Overall, rain regularly affects us as humans in different ways. Those ways include our physical and mental health. Going outside when it's raining, whether by foot or in a vehicle, can be risky if the rain is moderately strong. It can cause sickness in best case scenario, or even serious injury in the worst.

This is why it is very important to be wary of the weather forecast, so you know how to prepare if going outside. This knowledge is also crucial for how a person structures their plans.

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