Global 2 Release Statement - audio summary

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Transcript

Speaker 1: Welcome to the Deep Dive. Today, we're really getting into the nuts and bolts of, well, high tech disaster response, specifically Google's Flood Hub.

Speaker 2: Yes, and how global data makes that technology tick in real time. It's quite something.

Speaker 1: It really is. Now just before we jump in, a quick note for you listening.

Speaker 2: Right, we should be clear. We your hosts are AI derived from materials provided by WorldPop.

Speaker 1: And importantly, the audio you're hearing has been reviewed, checked and fully validated by the human experts at WorldPop.

Speaker 2: Exactly. So that's the setup.

Speaker 1: OK. So, our mission today, let's unpack how these AI systems actually predict floods and crucially, how WorldPop's population data fits in. It's the key really to making a forecast into something actionable.

Speaker 2: It absolutely is, and the scale here is, well, vast. Google system - the AI for river floods, it's now in over 100 countries, reaching something like 700 million people. And the big news as of late 2024 is the lead time they can give warnings up to seven days out now.

Speaker 1: Seven days. That's a significant amount of time for people to react.

Speaker 2: A huge difference. So how does it work? Let's break it down.

Speaker 1: OK. Yeah. So first it needs data, right? Lots of it flowing in constantly.

Speaker 2: Correct. It pulls in real time measurements, things like river water levels from official sources, say CWC in India. Or BWDB in Bangladesh.

Speaker 1: And weather data too, like rainfall.

Speaker 2: Precipitation data or satellite systems like IMERG, Early Run, so you get the immediate picture of rainfall.

Speaker 1: Got it. So, all this raw data feeds into the AI part.

Speaker 2: Exactly. It feeds into what they call AI Stage Forecast Models. The main one is an LSTM network. Long short term memory.

Speaker 1: LSTM, OK. What does that actually do?

Speaker 2: Well, think of it like this. LSTMs are really good at spotting patterns and data that changes overtime, like how a river rises and falls day by day. So, it takes all that input data and forecasts the river stage, the water level.

Speaker 1: Right. So it predicts how high the water will get. But a high river isn't always a flood that affects people, is it?

Speaker 2: That's the next step. Predicting the spread once a potential flood stage is forecast. They use other machine learning models. The key ones are called thresholding and manifold. These basically translate that predicted water level into: OK, if the river reaches this height - this is the area on the ground that will be underwater and how deep.

Speaker 1: And this is where the resolution comes in. I saw something about 16 metres.

Speaker 2: Yeah, 16 by 16 metres spatial resolution for those flood maps. It's incredibly detailed. Think, block by block, almost building by building.

Speaker 1: That's amazing. And this isn't just theory. They use this in India and Bangladesh back in the 2021 monsoon season.

Speaker 2: That's right, fully operational, covering a massive area - 287,000 square kilometres. Huge flood prone region.

Speaker 1: OK, so you have the super detailed map showing exactly where the water is predicted to go down to 16 metres, but knowing where the water is doesn't tell you who is in danger, does it? That feels like a critical gap.

Speaker 2: You've hit it exactly. That's the bridge. You need to connect that physical flood map to, well, people. Where do people actually live within that potential flood zone?

Speaker 1: And if your flood map is super high res, but your population map is just like big census blocks.

Speaker 2: This is where WorldPop comes in directly. To figure out the affected population in those target areas in India and Bangladesh, they explicitly used the WorldPop Global project population data.

Speaker 1: WorldPop data - accessed through Google Earth engine, I gather.

Speaker 2: Correct that high resolution WorldPop data provides the population density at a scale that matches the flood map.

Speaker 1: So, you overlay the WorldPop population density onto that 16 metre flood inundation map.

Speaker 2: And that tells you which populated areas are at risk and roughly how many people. That's what allows for truly actionable alerts.

Speaker 1: And the impact was huge, wasn't it? Over 100 million alerts.

Speaker 2: During that 2021 monsoon, yes Over 100 million alerts sent out to people's phones to emergency groups, direct targeted warnings enabled by combining the AI flood prediction with the population data.

Speaker 1: It really shows how these different data layers work together. The AI predicts the water.

Speaker 2: But it's the high resolution, reliable population data like WorldPops that makes it relevant for saving lives and managing risk. It's what allows for things like anticipatory action acting before the disaster hits.

Speaker 1: Like the frameworks they're planning in Nigeria you mentioned. Needing shared data.

Speaker 2: Exactly. Those systems rely on knowing who is vulnerable before the flood arrives, which requires both good forecasts and good population data.

Speaker 1 And the accuracy of the flood hub itself is pretty solid too, right? The error margins seem low.

Speaker 2: Very low. That median root means square error, 0.1 metres for a 24 hour forecast, 0.2 for 48 hours. That's remarkably accurate for river forecasting.

Speaker 1: So accurate science plus precise population data turns into a genuine life saving tool.

Speaker 2: It really does. But you know there's a final thought here. Kind of a sobering one linked to the Nigeria floods in 2022. The analysis emerging from that situation suggests that while the data the forecasts are vital, they aren't the whole story. Factors like poor drainage, inadequate town planning, especially the dense populations. These were seen as critical factors that made the disaster so much worse.

Speaker 1: So, the data can warn you, but if the underlying infrastructure or planning isn't there.

Speaker 2: Exactly. The data's power is ultimately limited by the real world context it operates in. The infrastructure of the policies. They have to be able to respond effectively to the warning, something to think about as these powerful tools become more widespread.