

# Columbia geophysicist Klaus Jacob on Hurricane Sandy

## “Disasters always amplify pre-existing inequities”

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The WSWS spoke with Klaus Jacob, a research scientist at the Lamont-Doherty Earth Observatory of Columbia University in New York, about the lessons of his research into climate change vulnerabilities and adaptation strategies in the wake of Hurricane Sandy.

Dr. Jacob has conducted numerous studies on disaster risk management, including an extensive analysis of the potential transportation-related impacts in New York City from Sandy-type flooding. The analysis was included in New York State Energy Research and Development Authority's comprehensive assessment of climate adaptation strategies, known as the ClimAID report.

Approximately one year after the publication of that report, the dire projections were confirmed as the storm surge inundated the transit system, completely shutting down mass transit in America's largest city and causing billions in damages. We publish the interview below, edited for length.

WSWS: Could you explain the purpose of the ClimAID report and what you found?

Jacob: The state of New York charged us with finding vulnerability of the existing transportation system and other assets in the [New York City] metropolitan area with respect to climate hazards. In this case study we focused, because we thought it was the most urgent issue, on the flooding from a coastal storm surge. By serendipity, but of course with considerable reflection, we chose a 100 year storm. We chose that because it is the norm by which residential buildings, as part of the national flood insurance program, are insured. We thought it would be interesting to use that, even though for infrastructure systems usually one applies more severe storms.

Well to our surprise we found that even the 100 year storm overwhelms the subway system and many of the roadways and tunnels in and out of Manhattan. We found moreover that the subway system would flood in as little as 40 minutes or less. That was the second big surprise because we had no idea a priori how long it would take even after we realized the 100 year storm would exceed the inlet heights of the ventilation and some of the subway entrances.

The interesting thing is if you go to higher flood levels it just takes a shorter time to achieve essentially the same effect. What is important if we have a sea level rise of 2 and 4 feet like we did in our calculation is not the additional flooding, but how much more often in the future the sea would flood the subway system and other tunnel systems.

Why is that so? Let's assume you need 8 feet of surge at current sea level. If you have an additional four feet by the end of the century, then you need only another four feet of surge to get to the entrance of the tunnels. So if you only need a storm that produces a four foot sea level surge, then flooding will occur much more often. Instead of a 100 year storm you can make it only a 5 or 10 year storm to achieve the same

thing. That is bad news because now if you annualize the damages, they go up easily by a factor of 10, or even a little bit more than that, by the end of the century.

**“Information is not used the way it ought to be used in a rational society”**

WSWS: In light of these findings, what was the expectation of how the information would be used?

KJ: We worked with the Port Authority, the MTA and all the other transportation agencies. They all were informed about the results. We had hoped that the various engineering departments that were privy to those reports would forward that information to their boards of directors, and the boards of directors would say, wow, we better do something about it. That never happened. It never reached the political level to the best of our knowledge. So the problem is that the political and managerial levels of those transportation agencies never got involved in the technical aspects and therefore in the financial aspects. Unless you bring it before the body that sets the budget for these agencies then it's wasted time. That information is not used the way it ought to be used in a rational society.

WSWS: The common refrain from all these agencies at every level of government, especially over the past few years, has been the need to cut funding, even for maintenance of the existing system. Given this, what do you think are the prospects the political system can begin to address this issue?

KJ: Well you can guess what the process will be now that the horses are out of the barn and we know what the bill will be—namely tens of billions of dollars in economic losses and certainly billions of dollars for the MTA and other transportation agencies. Now of course I'm sure the engineers are pushing their management to do something about it. But what will it translate to in the way we operate? There will not be public financing raining down from the sky, whether the sky is Albany, Trenton or Washington DC.

What will happen is they will say over how much time do we have to spread out the cost and what does that translate to in the bridge tolls or commuter fares. That's the way those agencies have to fund their budgets. It's unlikely that the major funding will come from let's say gasoline tax or other forms of tax, or federal transportation funding. So the question is really: is the public willing to pick up the costs for these investments in form of subway and bus fares, tunnel and bridge tolls, airport landing fares and marine terminal fees for the shipping business? That's where it comes down to you and me. Are we willing to pay for our safety and our uninterrupted service? And that's the hard question that we have to face in this country. We think we had a free ride by putting CO2 into the air, now it gradually dawns on us that you actually have to pay for that. That process will take still years to come, I'm afraid, before it really sinks in.

WSWS: That brings up an important point. In your report there is a section which discusses vulnerabilities of low income communities in particular and their ability to pay.

KJ: Absolutely, because they are the ones who depend on public transportation. They can't afford to be chauffeured into the city. So if the commuter has to pay, instead of it coming out of other taxes on higher income groups in a proportional way, you now put a much heavier burden on the users of public transportation. That means there's a disproportional levy on lower and middle income people.

WSWS: And when you consider the economic crisis persisting, with lower and middle income groups are already squeezed...

KJ: Well that goes with everything else, so that's not different in what we have to face with transportation, that's simply then part of the same politics. That's the whole thing you see, disasters always amplify pre-existing stresses and conditions. So if there inequities beforehand, they are amplified by disasters.

WSWS: Have you been able to assess in detail the aftermath of the storm and compare it with the projections in your study?

KJ: No, unfortunately. I'm following what the statements of the various agencies, what the governor and federal government are saying. I have the feeling that they're doing a little worse. Looking at our report, we estimated 50 or 60 billion dollars. My feeling is that by the time everybody has added up the losses, that 100 billion dollars for the storm for the Eastern US, not just Jersey and New York, is probably reasonable number as a starting point. Of course, some of these losses extend over many years because there will be business losses and even tax losses that will last for a long time. Some businesses may not ever come back. On the other hand, there are some gains--the building trades and construction trades, they pick up. I'm not an economist, I just know it's much too early to give any hard numbers.

#### **"Our institutional and political systems are not made to address" a changing environment**

WSWS: Do you see in a more general sense the disconnect between science and policy?

KJ: Yes, there are multiple disconnects. The first is that our whole concept of a stationary city in terms of urban planning and land use planning has to be revised. We live in a changing environment, particularly with the sea level and storm surge, but also precipitation events and heat waves, and maybe occasional drought waves in the future. We have a relatively fixed population that wants to stay where it is, a relatively fixed notion where our businesses want to say. That is in conflict with a changing environment.

Right now our institutional and political systems are not made to address it. In fact some of the influential fossil fuel driven sectors of industry do not want to budge at all because it would mean that they would be on the diminishing end rather than on expansion. Since how our economic system is always moving towards growth-growth-growth rather than sustainability, we are in a very difficult political-economic situation.

On the planning side there are multiple options for adaptation to sea level rise. The first is protection, which is what everybody calls the first line, which usually turns out only to be over the short to mid-term, that is 10 to maybe 100 year time scales. But if we want to have New York City around more than 500 years, that means we have to think about what the conditions will be 500 years from now. We need to think about how it is laid out in terms of the waterfront and elevation. Is it really built in a way that is sustainable? I would say absolutely not.

We have to think in an entirely different way. We have to think how the city in the coastal low lying areas will have to change in a vertical sense. If the lower parts of the city are more normally flooded, we would have to secure the lower floors and put all the utilities to higher floors, so that it doesn't matter if there's water in the basement. It becomes like Venice.

You just live with water being in the lower floors.

Another way to deal with this is gradually to retreat from low lying waterfronts and only occupy the higher portions of the city. Sea level will continue to rise for few hundred years, maybe level off in 500. We have high areas in areas in Staten Island and Queens for example that are practically not used at all. We're piling all these people on the waterfront and that has to change.

WSWS: So shifting from *what* needs to change to *how*. Do you have thoughts on how this can be done?

KJ: By the same old methods. If you want to bring change about you have to follow the trail of the money. You would have to tax every business activity in a flood zone and give bonuses to people where activity occurs outside the flood zone. Carrots and sticks, it's the same old method. But there has to be the political will to implement those carrots and sticks. Apparently it takes a couple of Sandy's--and who knows how many--before that will sink in. You can't just leave it to the free market if the free market is so shortsighted. Therefore government, in its best of functions, has to have a role to provide safety for its citizens and for its business activities. That's where we seem to differ in this country right now and therefore we are in deep trouble.

WSWS: The same is true on a world scale too, right? Climate change is a problem globally and the same types of issues arise.

KJ: Think of Bangladesh where a third of the population is essentially near 3 or 4 feet of current sea level. They don't have hurricanes, they have typhoons. And in addition they can have at the same time floods from the rivers originating in the Himalayas. So that is a huge problem, especially for a developing country that even under normal circumstances has its problems, and where Dhaka, its capital, is one of the fastest growing cities in the world, yet is one of the most exposed in terms of flooding potential.

Then there are the problems of the small island nations in the Pacific and Indian Oceans. They are essentially being wiped out. The UN doesn't even have a charter for environmental refugees, it only has one for political refugees. So what are those nations going to be? Are they simply going to be wiped off the map?

What happens to those millions of people on the island nations? They have made several attempts to voice that problem in the United Nations Assembly but they have always been shoved aside by the Security Council that has the final say on those things. Even if the UN Assembly would vote, which they have tried to do, they very quickly realize there is a big lobby against any such vote to declare sea level rise is a threat to those nations. That shows just that we are even on a global level as uneducated to what this all means to a large sector of the population that is more the powerless than the powerful.

WSWS: All this certainly underscores the need for scientific planning to be incorporated into the economy.

KJ: Science is the easy part. Politics and economics -- that's the hard part. Most of the scientific work has been done on a first order basis. You can always refine it. But we haven't done it on the political and economic side, so what's the point of refining the science if you don't move along on the politics and economics?

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