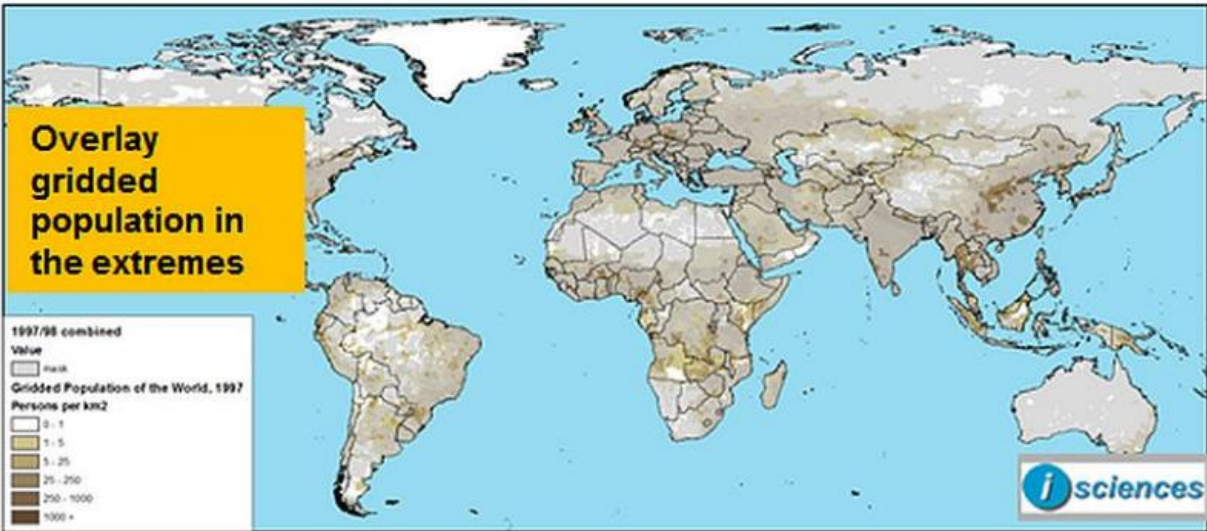
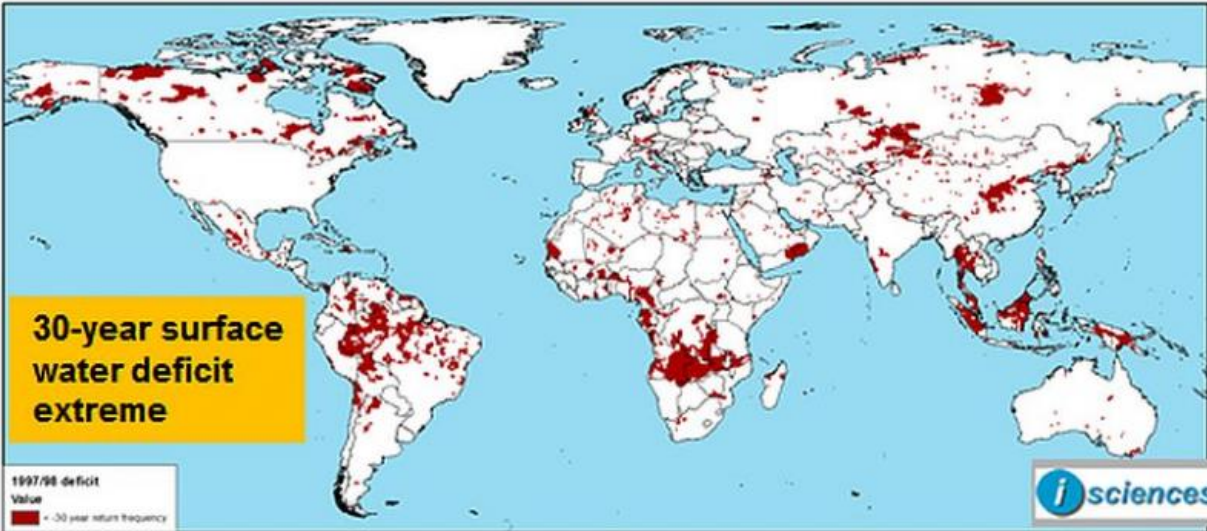
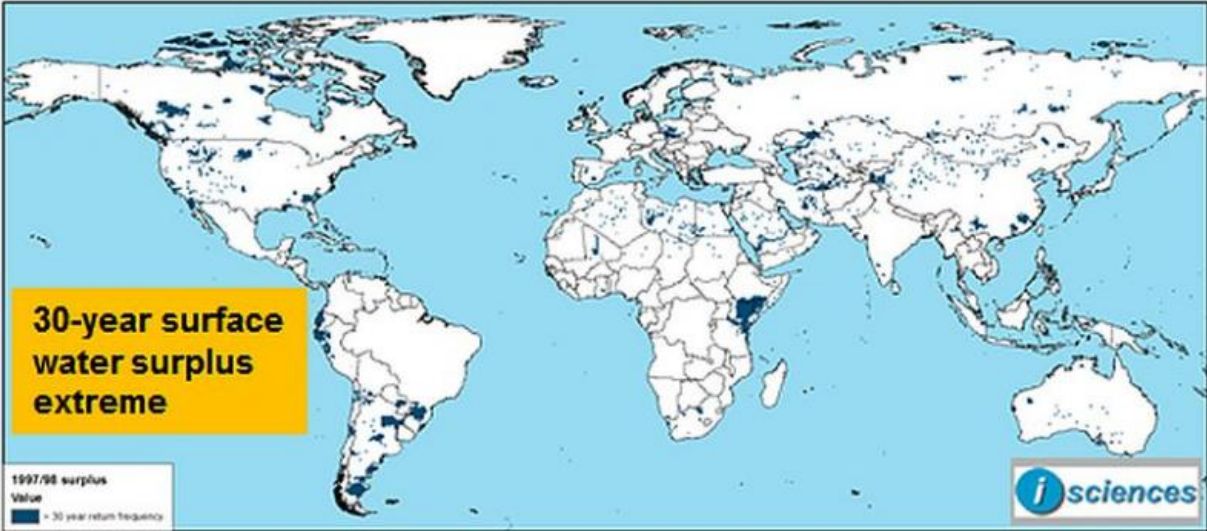


How bad will this El Nino be? Worse than you may think

November 23 2015, by Marc A. Levy, Earth Institute, Columbia University



Within areas affected by 1997-1998 El Niño, there are now 230 million additional people. Credit: Calculations and surplus/deficit masks, ISciences, LLC (2015). “Water Security Indicator Model.” Ann Arbor, MI: ISciences, LLC. Available on-line: <http://www.isciences.com/water-security-indicator-model>; Gridded Population of the World, CIESIN, beta.sedac.ciesin.columbia.edu/data/collection/gpw-v4.

Much of the discussion about the fear that the current El Niño will turn out to be even worse than the devastating 1997-1998 El Niño neglects a crucial fact. Today's El Niño is unfolding over a world that is in many ways more vulnerable than the world of 1997-1998. Just as today's climate continues to generate extremes without historical precedent, we are starting to see elements of social vulnerability also without historical precedent.

That is an alarming combination.

It is relevant because historical experience tells us that El Niño roughly doubles the risk of major political insecurity breakdowns in countries affected by its weather impacts. So if the year brings together unprecedented weather extremes and unprecedented patterns of fragility, the risks may be worse than our preparations.

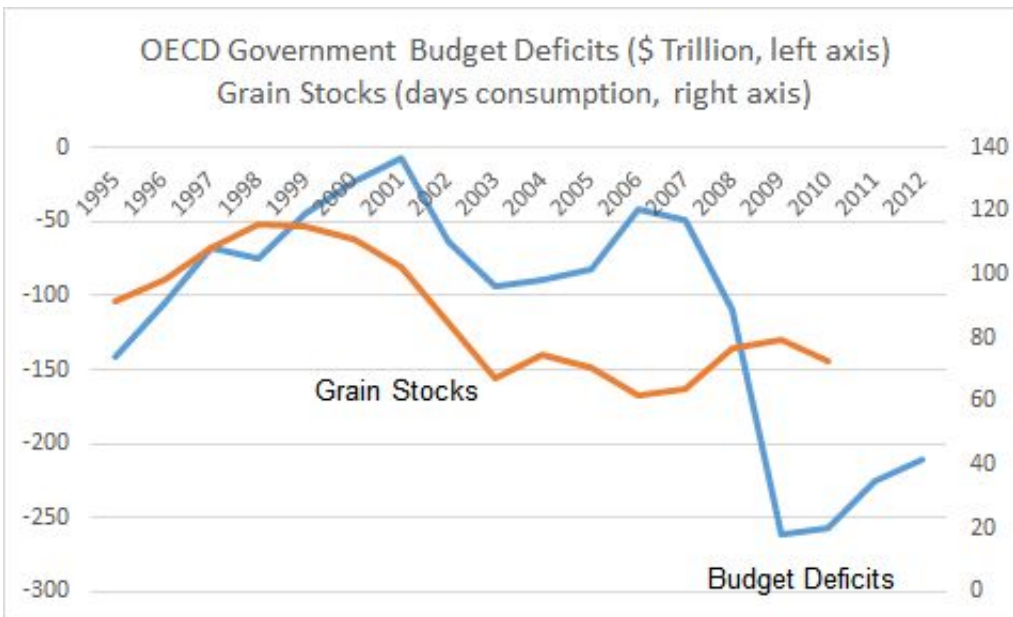
Think of a typical pair of office scissors. Their two blades are not especially sharp, yet they can cut very well because of how they interact. In the same way social impacts that arise from extreme weather depend on what kind of underlying vulnerability such weather encounters. We have heard a lot about the meteorological blade of the scissors.

Let us now consider the societal blade.

Global food prices in 1998 were at their long-term average. They have been markedly higher since the shocks of 2008, and even after a period of abating pressure last year remain 25 percent above their long-term average in real terms. As a result, poor communities and vulnerable regions have an elevated baseline risk of food insecurity. Compounding this effect is the unusually high global levels of income inequality, which Thomas Piketty and others have drawn attention to—the poorest of the poor are worse off in many parts of the world.

Changes to the global food system have diminished our ability to respond to food crises since 1998. Global food stocks have shrunk from about 100 days' worth of consumption to about 60 today. And changes in where those stocks are held make it far more difficult to direct them to humanitarian crises. Finally, government budget deficits in donor countries are far higher than before, making it harder to mobilize large crisis responses.

Politically, the world is showing signs of heightened fragility. Some elements of this fragility were already underway in 1998, and what is alarming is that they have not yet abated. One measure of such fragility is the number of countries experiencing a transitional political state characterized by neither strong democratic institutions nor strong autocratic institutions. Known as anocracies, such countries are not well equipped to absorb exogenous shocks and are highly vulnerable to various forms of instability. Since the late 1990s, they have been at historically unusual highs.



Credit: <http://apps.fas.usda.gov/psdonline/psdQuery.aspx>,
<https://data.oecd.org/gga/general-government-deficit.htm>, World Bank World Development Indicators

Other elements of political fragility are worse than in 1998. The amount of territory outside of state control has increased to an unexpected and scary degree since 1998, including a number of countries that qualify as failed states (such as Libya) and countries no longer exercising sovereignty over major areas (such as Syria). Such areas pose multiple risks. They provide havens for trafficking, terrorism and other illicit behavior. They trigger population displacement. They augment risk of epidemics. And the people within them suffer high levels of vulnerability to [food insecurity](#) and other impacts from climatic stress.

The trend in heightened political fragility is now clear enough to be counted as a defining risk of our age. It is also one of the saddest surprises of the past decade, following over 25 years of broad progress toward enhanced security and stability, as documented by scholars such

as Steven Pinker. In the last 10 years, security breakdowns have increased in number and intensity, and the resulting human tragedies and geopolitical upheavals have secured a permanent foothold in our daily headlines.

When the post-WWII record for global refugees and internally displaced populations was broken last year, topping 50 million for the first time, it came amid so much bad news that it scarcely got the attention it deserved.

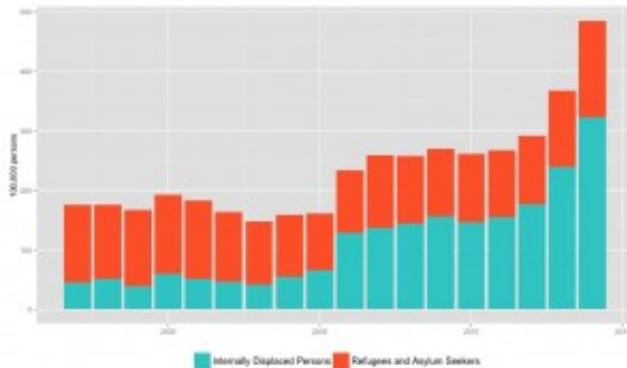
These changes take place against a backdrop of rapid population change in the poorest countries of the world, which has the effect of increasing the number of people exposed to the risks of El Niño. There are 1.3 billion more people in the world now than in 1998. Calculations with spatial data carried out by Tom Parris and colleagues at ISciences show that an additional 230 million people now reside within the areas most affected by the 1997-1998 El Niño.

That's like adding an additional Indonesia (203 million people in 1998) and Malaysia (23 million in 1998) to the El Niño front lines.

Moreover, in areas where rapid urbanization is not being met with equally fast increases in jobs and political participation, the potential for protests and instability is also rising. Here, too, the trends are not in our favor. In 1998 poor cities were growing at about 3 million people per year. Today the number is 7.5 million.

If you thought things couldn't get worse, recall that whatever weather shocks emerge from El Niño today will do so in the context of long-term climate change that is manifesting at a more rapid pace than we earlier anticipated. September 2015 was about half a degree Centigrade higher than September 1997, for example. For the year as a whole, 2015 is shaping up to be the hottest ever on record—if trends continue it will be

about a quarter of a degree hotter than 1998 and a third of a degree hotter than 1997.



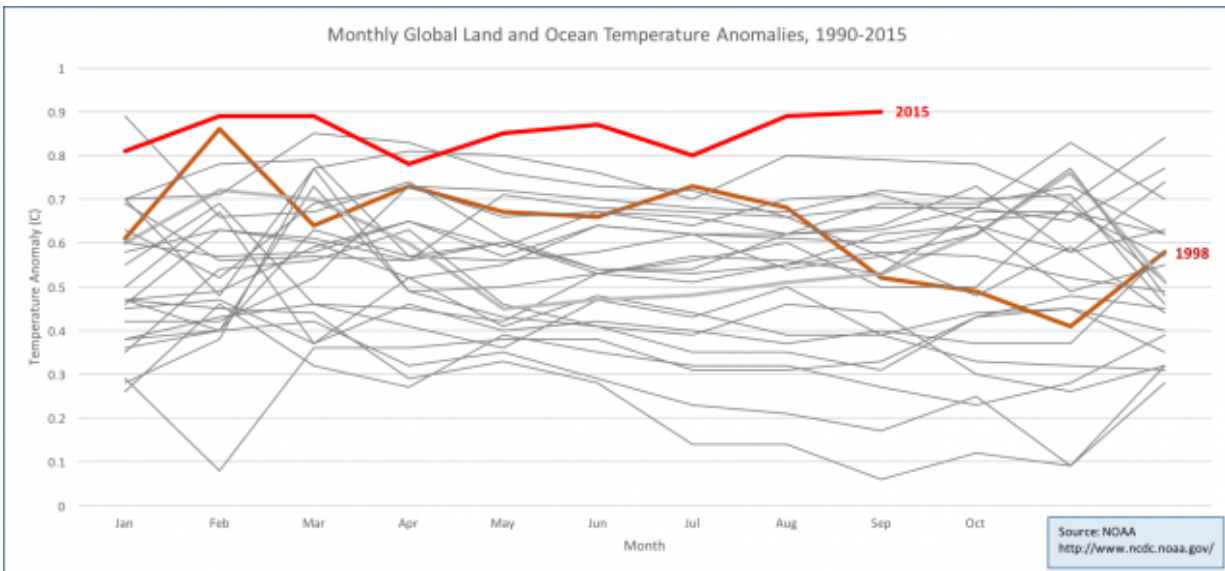
Refugees and Internally Displaced Persons exceeded 50 million in 2014, a post-WWII high.

Fractions of degrees may not seem like much at first glance, but when the global climate system entered lesser degrees of this non-analog state earlier in the decade we witnessed such unprecedented disruptive shocks as the heat waves that triggered the global food crisis associated with the Arab Spring, unusual devastating floods in Pakistan, widespread and traumatic wildfires in the western and southwestern U.S., and unusual large storms such as those affecting Myanmar, Philippines and the United States.

So the fact that the 2015-2016 El Niño will do its damage against an even higher level of baseline climate risk ought to give us serious pause.

Some societal risks we know with some confidence, stemming from analysis of the historical data. Food security problems, population displacement, disease outbreaks and political unrest are among such

risks. Others are less well understood. Being less well understood does not make them less significant.



2015 is likely to be the hottest year recorded. Credit: NOAA, <http://www.ncdc.noaa.gov/cag/time-series/global>

The risks that are relevant when considering how El Niño might interact with the underlying social and political changes underway are less predictable than El Niño itself. Cataclysmic breakdowns in human security are thankfully rare events, shaped by a number of causal forces that are marked by high uncertainty.

We cannot say whether El Niño will definitely trigger specific events culminating in large-scale crises in the coming year, in the same way that we wouldn't be able to know for sure whether a specific drunk driver will cause an accident.

But as with the drunk driver, we know enough to say the risks are high and scary. We ought to be looking harder at whether we are prepared.

Provided by Earth Institute, Columbia University

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