

The second difference is that the GEAS forecast relies on the WorldRun simulation system. Adapted from the GEAS ecosystem simulations that successfully predicted the unexpected extinctions of red squirrels in 2015, WorldRun draws on a multi-petabyte information base and a massively-parallel computing cloud. Running for nearly 50 days, the first WorldRun simulation offered a likely human extinction date sometime in the early 2040s. Subsequent modeling and confirmation tests have narrowed that likely extinction date to 2042 --just 23 years from now.

The third difference is that GEAS does not argue or believe that this future is unavoidable. This is perhaps the most important element of our forecast. This is not *fate*. If we act now--and act with intelligence, flexibility, foresight and creativity--we can avoid the final threat. We may even come out of this period far stronger than we were before.

The Superthreats

GEAS has identified five superthreats and given them memorable names as a way of encouraging discussion and awareness:

- ***Quarantine*** covers the global response to declining health and pandemic disease, including the current Respiratory Distress Syndrome (ReDS) crisis.
- ***Ravenous*** focuses on the imminent collapse of the global food system, as well as debates over industrial vs. ecological agricultural models, and basic issues of access, energy, and carbon.
- ***Power Struggle*** tracks the results of energy resource peaks and the shifts in international power as nations fight for energy supremacy and the world searches for alternative energy solutions.
- ***Outlaw Planet*** embodies the volatile mix of new forms of surveillance, transparency, civil rights, and access to information as people work out new rules for human security.
- ***Generation Exile*** follows the massive "diaspora of diasporas" underway globally, as the number of refugees and migrants skyrockets in the face of climate change, economic disruption, and war.

At GEAS, we were surprised when the WorldRun simulation produced these five issues as key threats to our existence. It's clear that none of these threats, individually, has the capacity to drive the human species to extinction. But it has become equally clear that, in combination, these threats reinforce each other, and make the easy resolution to any one threat difficult. The models demonstrated how easily these five could have a "vicious cycle" effect, leading all too quickly into a cascading set of catastrophic collapses of key global social and resource systems.

We were also surprised to see that climate disruption was not listed among our primary threats. However, climate change sets important thresholds for all five superthreats, which should be considered in the light of a still degrading global environment.

Considering the Threats

The five superthreats divide into two broad categories. Two of the threats--Quarantine and Ravenous--emerge from *changes to the physical environment in which humanity lives*. As with all of the super-threats, the key dilemmas embedded in these threats are sociopolitical, but both strongly reflect the old environmental adage that "nature bats last." Two more of the threats--Outlaw Planet and Generation Exile--come directly from *problems of social cohesion and civil society*. These two super-threats undermine our capacity to respond quickly and effectively to global dilemmas. The last threat--Power Struggle--straddles the two categories, with both a strong environmental component and a basis in the fragility of existing institutions.

Put simply, each of these five super-threats makes the others worse.

The WorldRun Simulation

In the multiple WorldRun simulation exercises GEAS has performed, the details can vary, but the outcome has been consistent: by the decade between 2040 and 2050, typically closer to the beginning of the period, the combined drivers described here as "superthreats" have driven the global human population to collapse. The super-threats are rarely directly responsible for the result; instead, the combination has so weakened human civilization that any one new global crisis looms catastrophic: a succession of global warming-driven superstorms, regional war, or new pandemic disease--any of which would become more likely as a result of the superthreats--would be enough to trigger the wholesale collapse of the human endeavor.

