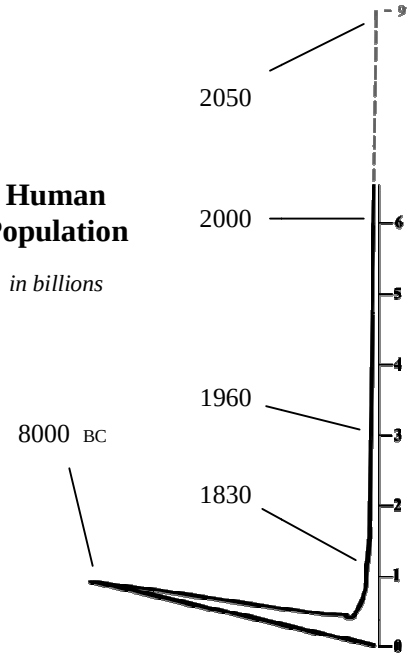
Nine Assumptions
That Invite Calamity

Today, with breathtaking complacency, most members of our political, news, and journalistic leadership continue to utterly ignore discussion of the numbers and issues that have been raised in Wecskaop. Instead, despite our trajectories and their implications for humanitarian, civilizational, and biospheric disaster, we are given sports scores, political and celebrity gossip, weather reports, game shows, and moment-by-moment stock trading indices. Meanwhile, by closing their eyes to one of the top five or six overarching events in all of human history, and one that is rapidly and dangerously unfolding right now, their emphases manage to distract all of us from a *calamitous set of false assumptions* upon which we unconsciously base the overwhelming majority of our actions and decisions.



In this excerpt, then, we make it our goal to enunciate the dangerous set of presumptive "givens" that invite calamitous outcomes of every sort.

By enunciating eight or nine of these presumptive "givens," we begin to see them for what they are: *as nothing more than simple assumptions*, which, when examined rationally, have little or no evidentiary support whatsoever.

Consequently, this PDF spells out more than nine of these vague, flawed and complacent suppositions that invite us to recklessly gamble all that we hold dear for the sake of corporate profits uber alles, a few dollars more, and "business-as-usual."

Unwarranted Assumptions

We are gambling our civilizations, our futures, and our planet on the widespread, but faulty and unjustified suppositions that follow. For far too long, we have allowed ourselves to uncritically subscribe to their soothing and comforting seductions. If, however, we allow our leaders and ourselves to persist upon this path, we invite calamity.

ASSUMPTION 1:

Running out of food *or* particular resources, though important, may not be the first limiting factors that restrict us, and we may be distracting ourselves if we imagine that they are. Although limited supplies of food or resources pose real dangers and concerns, in many ways they reflect a decades-old kind of thinking from the 1960s and 1970s.

In today's world, for instance, it increasingly appears that "major ecosystems will begin to fail long before we consume every last renewable resource" (Taylor, 2008). Today, for example, it may be that our industrial and societal wastes, along with the physical damage that we inflict on earth's

climatic and biological machinery already constitute unfolding and ongoing excesses of calamitous potential.

We must not forget, for instance, that:

(a) No other animals on earth *supplement* their biological wastes with the additional societal and industrial wastes the way that we do;

(b) No other animals on earth have **EVER** supplemented their wastes in the way that we do; and

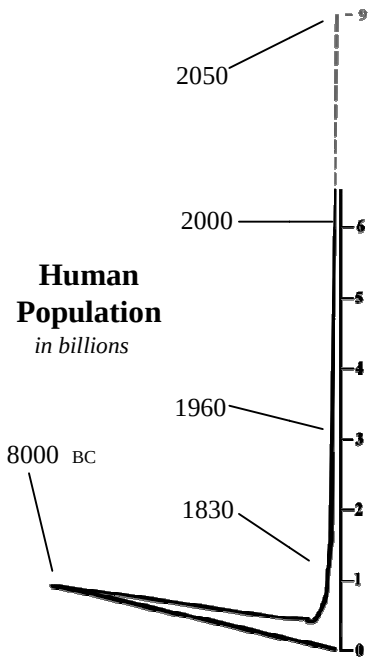
(c) Nor have any populations of even the worst red-tide dinoflagellates **EVER** supplemented their cellular and metabolic wastes with a daily and ongoing avalanche of societal and industrial wastes as our own species is doing today, and on a planet-wide scale, at that.

ASSUMPTION 2:

We dangerously *assume* that the continued functioning of earth's environmental, biotic, and climatic machinery is simply a given – that it must somehow constitute a form of ongoing constant that we can always count on, regardless of how many billions of us try to inhabit our planet. As a result, we sail along, taking the continued functioning of earth's life-support infrastructure *entirely for granted* under *nothing more* than an *assumption* that this machinery must be magically invulnerable, no matter how much pollution, damage, and abuse that we may heap upon it.

Imagine, for example, a person who has inherited an astounding automobile, and that it is the *only* automobile in the known universe. Having never known any other condition, the owner might erroneously suppose that the vehicle could *always* be counted on to continue to function, no matter how much abuse and damage to which it might be subjected.

Presumably, financiers and economic apologists take care of their automobiles, coporate jets and megayachts, which are, after all, replaceable. Why then are they so utterly cavalier when it comes to the only planetary life support machinery in the known universe?



ASSUMPTION 3:

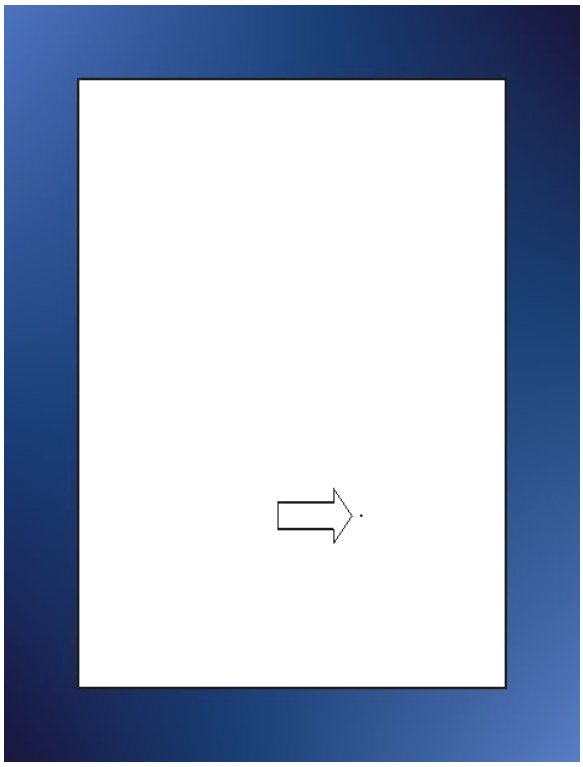
Economic apologists urge us to gamble our futures, our civilizations, and earth's life support machinery by urging us to suppose that we can continue with infinite and unending growth and "business-as-usual" forever (a philosophy, of course, that happens to serve the interests of greed). Ironically, advocates of business-as-usual urge their philosophy upon us at a moment in history that is colossally *different* than any conditions that our species and our planet have ever faced.

Consider again our graph (left) with its skyrocketing trajectory of world population between 1830 and 2050, a trajectory that most emphatically does NOT constitute "business-as-usual" biology. In reality, it would be impossible to depict anything that is more extraordinary and less routine than the trajectory that it depicts. There has never been a more radical human departure from our past numbers, impacts, and relationships with our planet and its environment.

Our trajectory in this graph is unprecedented in human history. It is in fact, more severe and more extreme, but otherwise not unlike, an economic or financial bubble, except that there will be no planetary "do-overs" available if we don't get things right this first time around.

ASSUMPTION 4:

We also invite catastrophe if we allow ourselves to imagine that "*vast amounts of open space*" have any bearing whatsoever on our currently calamitous conditions of population growth and overpopulation. As chapters four and eleven have shown, for example, to imagine that the simple presence of "open space" somehow frees us from the effects of other limiting factors is a calamitous misperception.



Recall, for instance, the image depicted here in which the dot denotes **2/1000ths of one percent** of the rectangle's total area.

As our earlier chapters (and PDFs) note, in marine environments, outbreaks of dinoflagellate red-tide by organisms such as *Karenia brevis* manage to calamitously-poison the waters in which they reside even as the *K. brevis* cells themselves physically occupy **less than 2/1000ths of 1%** of the "open space" that remains theoretically available.

Such outbreaks of red-tide constitute *quintessential examples* of population explosions that result in catastrophe by release of **wastes** into the environment in which the populations reside, and in this respect,

they may have something
instructive to tell us about ourselves.

Similarly, in a vat of wine, populations of yeast cells poison their environment by their production of ethanol even as the yeast cells themselves occupy a volumetrically insignificant portion of the "open-space" that remains theoretically available. Also, elsewhere we have seen examples of catastrophic 99% die-offs in reindeer herds that underwent collapse while the reindeer themselves physically-occupied **less than 1/10th of one percent** of the "open space" that was theoretically available.

We also know that it is routine for the biota of a eutrophic ("over-fertilized") pond to drive entire water masses, and often the entire pond in which they reside, to **anoxia** (depletion of dissolved O_2) even as the organisms themselves occupy only a fraction of the volume that remains theoretically available. Finally, a mathematical calculation of Easter Island's total area (open space) at the onset of the collapse of its human population hints that the island's human residents and their environment both <u>underwent collapse</u> even as **99.999 97%** of the island's total area **remained unoccupied** and "vast amounts of open-space" still remained.

It is interesting to note that the results (2/1000ths of 1%) of the dinoflagellate analysis show such an unexpected similarity to a similar analysis applied to the historical human population living on Easter Island (less than 3/1000ths of 1%).

A major difference, of course, is that dinoflagellate impacts arise from *wastes* released into their surroundings, while the impacts of the human population on Easter Island, which was at a pre-industrial stage of development, arose from *physical damage* to their surroundings involving deforestation and over-exploitation of island birds, seabirds, and vegetation.

Today, however, our own highly-industrialized populations have: (a) Greatly-amplified physical impacts (think of chain saws, logging concessions, asphalt paving, and industrialized fishing fleets, for example); (b) Our own impacts are a *global* phenomenon, and, (c) As we have become industrialized, we have now joined and enormously surpassed dinoflagellate populations as a species that produces and releases wastes into our environment.

Thus, in addition to our greatly-amplified physical damage and an enormous world population (that will see us add our 7th, 8th, and 9th billions between now and mid-century), we must now add our unprecedented production of industrial and societal wastes. Therefore, not only do we release the normal cellular and biological wastes to which natural systems are generally adapted, but *our species alone* SUPPLEMENTS its biological wastes with an unparalleled, ongoing, and ever-increasing avalanche of industrial and societal wastes in a way that is:

(a) Unique among all animals on earth,

(b) Unique among all animal species that have EVER lived, and

(c) *Is multiple orders of magnitude* worse than any catastrophic outbreak of dinoflagellate red-tide in the history of the earth.

ASSUMPTION 5:

Recalling an earlier PDF in this series ("razor-thin films"), we mistakenly *assume* that the seeming immensity of earth's atmosphere and seas must make them largely invulnerable to mankind's collective impacts. In razor-thin films, however, we have seen than earth's atmosphere and seas are actually astonishingly thin and fragile films. Mathematically speaking, for example, the thin layer of water that we refer to as an ocean exists only as a thin and precarious *surface film* that is only ***six one-hundredths of one percent*** as thick as the earth itself.

To illustrate this depth to scale on a classroom globe, we would need a layer of water twelve one-thousandths of an inch deep to proportionately depict the depth of earth's oceans (ibid). If we were to wipe a wet paper towel across a twenty-inch globe, the film it leaves behind would be too deep to properly represent the depths of earth's oceans. Thus, the apparent immensity of earth's ocean is actually an illusion arising simply from our own diminutive size.

And we also saw that our ocean of air, earth's atmosphere, can be viewed in a similar way. If we analyze the proportional depth of earth's atmosphere, we find that what appears to be a seemingly endless atmosphere is also little more than another thin and fragile film that astronauts and cosmonauts have likened to a single layer of skin on an onion.

Next, then, came our discussion of billions of us with our automobiles backed up in crowded traffic on a busy five-lane highway with hundreds of other cars and trucks and buses spewing noxious exhausts into earth’s atmosphere during each and every rush hour, grocery run, postal delivery, and long-distance trip. To put such behaviors in context, we noted that *we are the only animals on earth that do this*, and that we repeat this behavior every day, again and again and again, in Beijing, Los Angeles, Mumbai, Tokyo, Jakarta, Karachi, Cairo, Rio de Janeiro, London, Moscow, and New York City.

These quick examples, and others like them, underscore the unprecedented extent to which each of us as individuals are contributing *much more* than our body wastes to our surroundings, releasing more and more billions of tons of waste, without fail, relentlessly into the onion-skin-thin layer of air that makes up earth's atmosphere. And these behaviors do not represent occasional or once-in-a-lifetime indulgent excesses. Instead, they reflect our daily behaviors – billions of repeated assaults each and every day. *No other animals on earth do this* – how can we imagine that endless billions of us can endlessly behave in this way without calamitous repercussions?

If world population did not grow at all, all of these impacts would likely double as the world's poorest nations industrialize and seek to emulate our own standard of living. Knowing that earth's atmosphere is not responding to our assaults very well right now, we are nevertheless on-track to add at least a 7th, 8th, and 9th billion to our numbers by mid-century.

ASSUMPTION 6:

Another assumption invites us to imagine that we can escape population concerns by supposing that other planets constitute a safety valve of last resort as our numbers continue to skyrocket in the decades ahead. Recalling four PDFs in this series (exponentials I-IV), however, we assesed the real-world costs, logistics, and implications of such suppositions, and demonstrated the colossal impracticality of such suppositions.

Aside from prohibitively hostile conditions existing on the other planets of our solar system, the problems involving costs and logistics are also insurmountable. Imagine, for example, how much it will eventually cost to fly a dozen astronauts to Mars aboard a small fleet of three or four spacecraft.

Suppose, instead, that we decide to just transport one or two billion people to Mars to eliminate overcrowding at home, remembering, of course, that a billion is a truly enormous number. Now imagine how much it would cost to fund the hundreds of thousands of missions that would be necessary to accomplish such a feat – not to mention all the expenditures needed to build the necessary homes, factories, farms, roads, water and sewer plants, schools, and similar infrastructure the new human colonies would require on a new planetary home.

Might we send a dozen or so astronauts to Mars on a mission of exploration? Of course. But even if billions of people volunteered themselves and their families for such a hazardous trip, *all the governments and taxes in the world could not afford to send those billions to Mars*. It would be an utter nightmare of expense and logistics to fly billions of people to Tierra del Fuego, never mind convincing any of those same billions to transfer their homes and families to the planet Mars, and then coming up with the money and spacecraft to get them there.

ASSUMPTION 7:

Some writers ask us to suppose that humanity somehow has all the time in the world to deal with our problems, even though our 7th, 8th, and 9th billions, and possibly more, are all on-track to arrive by mid-century. We most emphatically *do not* have all the time in the world.

Instead we must remind ourselves of our earlier example in this series in which an imaginary, but valiant student would require **38,461 years** to complete one billion homework questions. Then we need simply to contemplate adding our seventh billion by 2012, another by 2027, and still another

by mid-century. These numbers will worsen, and most assuredly will not solve, the many crises that we already face.

ASSUMPTION 8:

For most of us, our schooling has targeted proficiency in the "arithmetic" mathematics or grocery-store arithmetic of the 1930s. In contrast, we generally have too little training in the applications of, and the counterintuitive and deceptive nature of, exponential mathematics. As a result, we mistakenly *suppose* that the consumer mathematics that we are taught in elementary school somehow enables us to correctly interpret numbers that are growing exponentially.

As former CIA director James Woolsey has noted,
generations living today need to understand that

"*nature is not always going to behave in linear fashion*
[just] because our minds think that way."

(As cited by Friedman in Hot, Flat, and Crowded; 2008; emphasis added)

Similarly, our four PDFs addressing EXPONENTIAL mathematics demonstrate that "grocery-store" analyses of numbers that are behaving exponentially not only do not work, but actually blind us to both the degree and the immediacy of impending danger.

ASSUMPTION 9 (and MORE):

Finally, we have a tendency to imagine that humans must be somehow exempt from nature's rules; that such rules don't apply to humans; that earth's ability to accommodate more and more billions of human beings is somehow infinite; that delayed feedbacks will not cause us to overshoot earth's carrying capacity for our rapacious and industrialized species; as though herds of reindeer and populations of dinoflagellates can undergo ecological release and climb-and-collapse crashes, but that our own species is somehow immune to such outcomes and that, as human beings, we ourselves, both individually and collectively, must be magically endowed with demographic invulnerability.

(Our economic systems and politicians, for example, never, ever get anything wrong, do they?)

Without the concepts, information, data sets, and examples collated in Wecskaop and excerpted in this PDF set, we have little hope of avoiding the calamities that our prevailing assumptions and mindsets promise to bring about.

And a quick universalization of these can and must be achieved by radio, television, digital, and
internet venues with a Franklin Roosevelt / Winston Churchill scale of mobilization and response.

Warnings, Inaction, and Delayed Responses

We know that even in the richest and most advanced societies, that we and our leaders commonly defer action, ignore problems, wager incorrectly, and/or commit assorted blunders, some of which are colossal. And we keep learning that this occurs with tragic regularity and with ruinous results.

Recalling the effects of hurricane Katrina on New Orleans, for example, is instructive: Despite scholarly warnings and engineering reports concerning the inadequacies of the city's protective levees, government officials and politicians failed to remedy the matter for years and years. Instead, officialdom reacted *too slowly* or *not at all*, leaving only luck and inaction to stand against

catastrophe, so that the city was demolished upon the arrival of 2005's category four hurricane Katrina. And of course, the history of every society is replete with examples of inaction, ignored warnings, and delayed and/or inadequate responses.

In the case of New Orleans, at least, the price to be paid when the warnings were greeted with inaction, inattention, or inadequate responses was comparatively localized. As a result, the Katrina disaster, as serious as it was, amounted to a localized event. *In the case of New Orleans, only a single city had to pay the price*, so that the point to be made is this:

For decades, top scientists have warned us repeatedly, again and again and again, of the potentially calamitous implications of our ongoing population/industrialization collisions with earth's climatic and biotic machinery. Yet, it seems that too many of our journalists, policymakers, and economic sectors appear content to count on nothing more than luck, faulty assumptions, and inaction to save us from the collision that is unfolding before our eyes. In the case of today's demographic tidal wave, however, the repercussions do not constitute a threat to just a single bridge or a single city:

Instead we are putting at risk the entirety of earth's biota
and the natural systems that underpin civilization itself.

Whatever efforts and progress we can cite, fifty years of neglect, specious arguments, and inaction have brought us to this: As these words are written, we continue to add approximately 800,000 additional people to our planet every four days.

And even more ominously, we continue to add a **BILLION**
additional persons to our population every 12 to15 *years*.

And all of those homework questions over a span of 38,461 years
dramatically underscore the enormity of each such billion.

As a result, we have addressed carrying capacities, overshoot, limiting factors, delayed feedbacks, inadequate responses, as well as two classical examples of mammalian climb-and-collapse population studies

which both culminated in **99%** *mortality* of the population undergoing collapse.

In addition, our PDFs have also addressed J-curves, self-intensifying feedbacks, thresholds, tipping points, and unintended consequences. We have seen that bridges, elevators, aircraft, environmental systems, and our planet itself have thresholds, carrying capacities, and limits that cannot be transgressed without inviting calamity. And we have examined lists of ecological services, concepts of ecological release, and sampled the implications of our ongoing population-environment impacts upon other species, natural systems, our fellow human beings, and civilization itself.

Default Settings

Let us contemplate, then, several closing thoughts:

There are certain decisions that we should have made three decades ago about our demographics. If we make no decisions, or if we make the wrong decisions, then our planet has default settings that will be applied. And while we are aware that Wecskaop, like any book, could be in error, it is *far more likely* that the growth-forever mindsets, rosy scenarios, specious arguments, faulty as-

sumptions, and sweet suppositions that are urged upon us by economic theorists and corporate apologists are, like a Wall Street bubble, carrying us toward biospheric and civilizational collapse.

What if, for example, Wall Street's prevailing assumptions, ideologies, arguments, and assurances (which ask us to gamble virtually everything, including the earth's biosphere and its life-support machinery) turn out to be as flawed as its performance, policies, and behavior in the economic debacle that it has just given us as this is written in 2008?

What might be the biospheric and demographic outcomes if the carrying capacity-biology-ecology-demographic policies that are urged upon us by Wall Street's financial, economic, and corporate elites turn out to be as erroneous as the mistakes that they have just exhibited in their own areas of claimed expertise?

Wecskaop suggests that a continuation of today's demographic tidal wave almost certainly constitutes *the greatest single risk that our species has ever undertaken* and proposes that our species must elect to err on the side of demographic caution. <u>If we choose the path of caution</u> and should Wecskaop then turn out to be wrong, the consequences would not be so terribly bad, for the world might then, for instance,

simply end up with a **stable** *population*
like that seen in Spain as this is written.

What are the *consequences* for humanity and earth's natural systems if Wecskaop and our assorted PDF excerpts should happen to be in error?

If we heed its concerns, we will stabilize our populations, educate all citizens about our planet, ensure that vast regions of earth's biosphere are set aside and protected from roads and human intrusion, and we will direct our monies and our efforts toward making life, education, health care, cities, and opportunities better for populations existing today – instead of attempting to frantically keep up with an avalanche of infrastructure and social needs generated by one additional billion followed by another and another in the decades ahead.

On the other hand, if humanity should decide to rely upon Roger Revelle's or similar sky-high estimates, or to follow the pedal-to-the-metal, the-more-the-merrier, and the rosy scenarios directions that are urged upon us by assorted corporate, Wall Street, and economic interests, and should it turn out that those rosy and specious suppositions are in error, the results may include biospheric, humanitarian, and civilizational nightmares of an unimaginable scale.

A half-century ago, Dr. Martin Luther King, Jr. spoke of "the modern plague of overpopulation. What is lacking," he said, "is universal consciousness of the gravity of the problem and the education of billions of people who are its victims" (see King, 1966; Bartlett, 2000; Wooldridge, 2007; Ehrlich and Ehrlich, 2004). Today, Dr. King's insights are more applicable than ever. If we continue to proceed complacently, as we have already done for far too long, it may be that civilization's prevailing philosophy will also become its last words and its epitaph: "business-as-usual" -

or perhaps, in Eric Pianka's words (2008), "we waited too long."

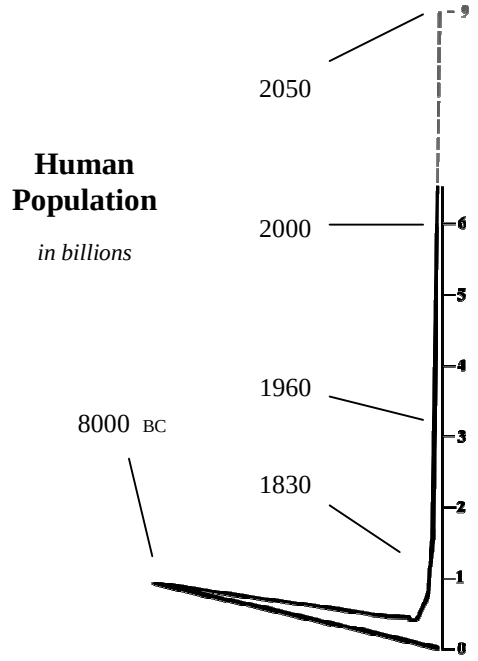
Thomas Friedman recently noted that "there is a line between can-do optimism and a keen awareness that the hour is late and the scale of the problems practically overwhelming" (Friedman, 2008). To achieve the threshold levels of demographic and biospheric literacy envisioned in Wecskaop and briefly excerpted in these PDFs will require a Franklin Roosevelt / Winston Churchill level of mobilization and response that should have begun two decades ago.

As it is, we close by offering two questions that will carry us foward to one or another of two very different destinies:

(1) Unlike dinoflagellates, ***we*** all understand limits and limiting factors, the enormous size of a billion, carrying capacities, thresholds, tipping points, and delayed feedbacks, along with the power and deceptive behavior of exponential mathematics, don't we?

(2) In addition, we can be sure that our own species will manage to avoid demographic catastrophe because, after all is said and done, we are ***smarter*** than a herd of reindeer or a population of mindless, one-celled dinoflagellates -

aren't we?



Although it is true that "to succumb to hope…is as dangerous as to succumb to despair" (Monbiot, 2006), the words of the famed anthropologist Margaret Mead also ring true: "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has."

A continuation of today's demographic tidal wave *may constitute the greatest single risk that our species has ever undertaken*.

Excerpted from
What Every Citizen Should Know About Our Planet
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Expanded implications of this excerpt are also
addressed in additional PDFs in this collection:

- Razor-Thin Films - Earth's Atmosphere and Seas
- Numerics, Demographics, and a Billion Homework Questions
- Conservation planning - Why Brazil's 10% is Not Enough
- Eight Assumptions that Invite Calamity
- Climate - No Other Animals Do This
- Critique of Beyond Six Billion
- Delayed feedbacks, Limits, and Overshoot
- Thresholds, Tipping points, and Unintended consequencs
- Problematic Aspects of Geoengineering
- Carrying Capacity and Limiting Factors
- Humanity's Demographic Journey
- Ecosystem services and Ecological release
- J-curves and Exponential progressions
- One-hundred key Biospheric understandings

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