

Overview of the Mental Health and Psychosocial Impacts of Climate Change

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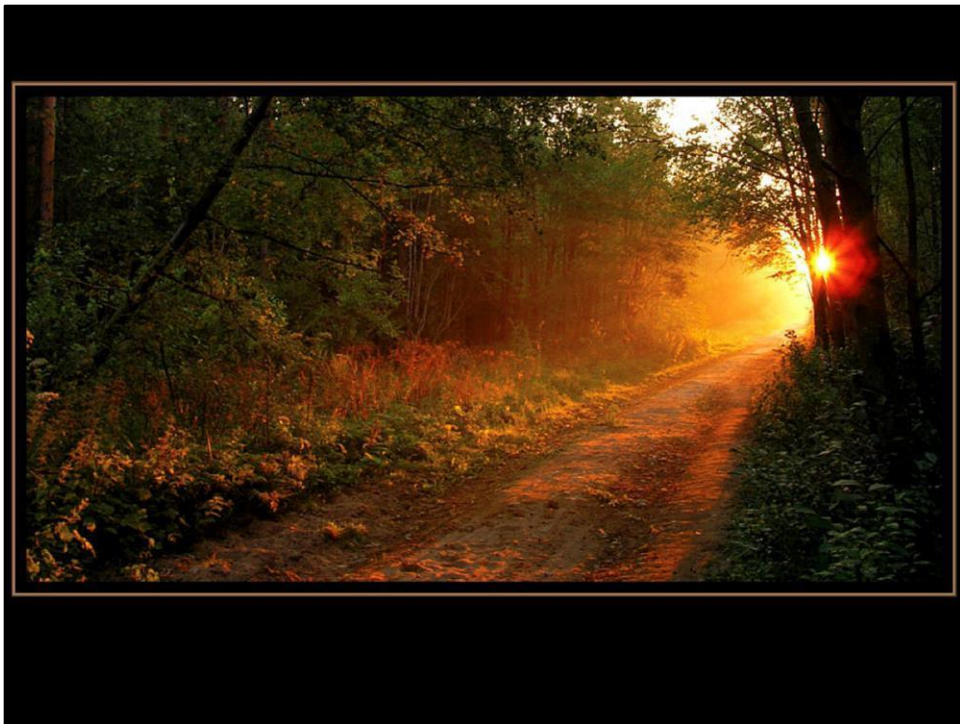
June 12, 2017

American Public Health Association

International Transformational Resilience Coalition

The following contains slides and notes from Dr. Lise Van Susteren's presentation during the "Building Mental Wellness and Psychosocial Resilience for Climate Change" workshop hosted on June 12, 2017 from 12:30-2:30 pm EDT. The notes are for instructional purposes only and should not be distributed, modified, or reproduced without the expressed consent of Dr. Lise Van Susteren, MD.

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SLIDE 1

I was asked to give an overview of the mental health and psychosocial toll of climate change - the success stories providing hope and showing human resilience are addressed elsewhere.

About my tone – as a physician using the medical model...the patriarchal attitude that patients should be protected from the truth about their life-threatening illness was abandoned long ago because it treated people like they were children –suggesting ***the doctor knew better*** what they could hear. But treating patients like children *stood in the way of making informed decisions*. The same goes for infantilizing the public about the ***climate crisis***.

The public needs to know the truth.

That said – telling people bad news is tough and must be a **two-step process**
#1 telling it like it is and
#2 offering empowering actions that help alter the outcome.. We can prevent or manage the worst impacts of cc if we want it enough to take sufficient action.

All the physical impacts of cc – those affecting us both directly or indirectly –all the losses, injuries, illnesses, displacements – carry with them an attendant emotional

toll that must be included as we tally up the mental health and psychosocial impacts of climate change.

Today I will emphasize what is overlooked and carries the biggest burden; starting with some of the psychological impacts for which we have data, and then moving on to what is not so easy to measure. As important as data is, we must not get lost in it at the expense of drawing emotion, because **emotion** is at the heart of what moves people to action.

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Extreme Weather Events: *heat waves, storms, fires, floods...*

SLIDE 2 EXTREME WEATHER EVENTS

Heat waves, Storms fires and floods - increasingly intense and frequent. In the last two decades extreme weather has wounded, displaced or required emergency assistance for 4 billion people. Half a million have died.

HEAT

July 21, 2016. Kuwait, Temperature recorded at 129.2, the world's record. Next door in Iraq it was 129.

15 of the 16 hottest years on record have occurred since 2001.
2017 may be on track to be the hottest year ever.

The relationship between hot weather and crime is linear -- as it gets hotter, people get more aggressive



4% between individuals

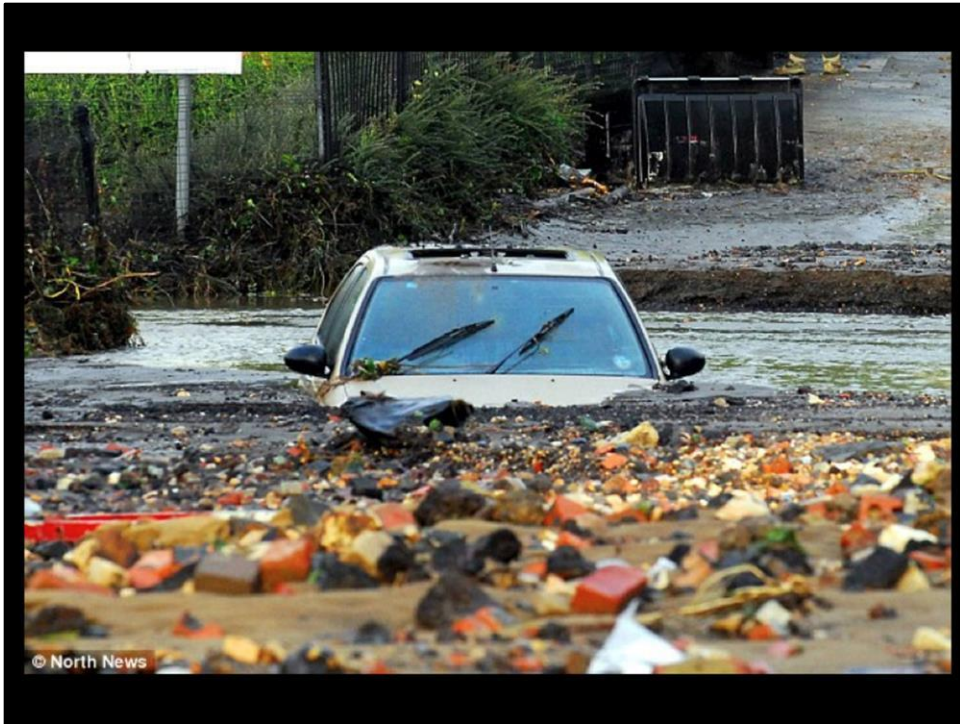
14% between groups

SLIDE 3 TEMPERATURE AND AGGRESSION: we know of the link between extreme climate and weather events to an increase in aggression.

For each standard deviation of increased T and rainfall, we can expect a 4% increase in conflict between individuals and a 14% increase in conflict among groups.

These findings are valid for **all** ethnicities **and across every region** of the world.
SO - more assaults, murders and suicides...

An increase in UNREST all over the world should come as no surprise.



SLIDE 4 FLOODS are responsible for half of the disasters from extreme weather events. Bacteria, viruses parasites, chemicals, human and animal waste are washed into flood waters, vectors swarm in it. Exposure to the water puts us into contact with these pathogens. We drink it, bathe in it, clean up in it, and after the waters recede, live in it. Though the immediate threat may not be visible – the illnesses can show up down the road – think lead and Flint. I cite this as an example because the rage at government inaction when people believe we knew better and just didn't take action - - contributes to the rise of cynicism and dangerous breakdown of confidence in our institutions.



SLIDE 5 WHEN THE PLACE you call home is burned down, blown away, or flooded, when you lose your possessions, maybe your pets, your livelihood, see injuries illness and death, the mix of fear, anger, sorrow and trauma can easily send us to a breaking point.

Mental Health Professionals are seeing a full range of psychiatric disorders emerge in these situations – Major Depression, Anxiety, PTSD, – a rise in drug and alcohol abuse as people attempt to cope. Family stress leads to domestic violence - mostly against women. It includes child abuse.

Some of us are lucky enough to be at a distance from the world's ongoing extreme weather events - but we're not potted plants sitting here – what scars are forming in us seeing others drowned, burned, flooded, starved?



CHRONIC CLIMATE CONDITIONS:

SLIDE 6 DROUGHT from persistent high temperature are driving up suicides among farmers in India, rural Australia, South Africa, and leading to rationing and water wars in the US.

With persistent high temperature and the ever-expanding desert it creates, the Middle East, it is predicted, may well be uninhabitable by the end of the century.



Roughly ten feet of sea level rise, well beyond previous estimates...and in as few as 50 years...

Atmospheric Chemistry and Physics; Hansen et al; Mar 22 2016

"Parts of our coastal cities would still be sticking above the water, but you couldn't live there." Dr. James Hansen

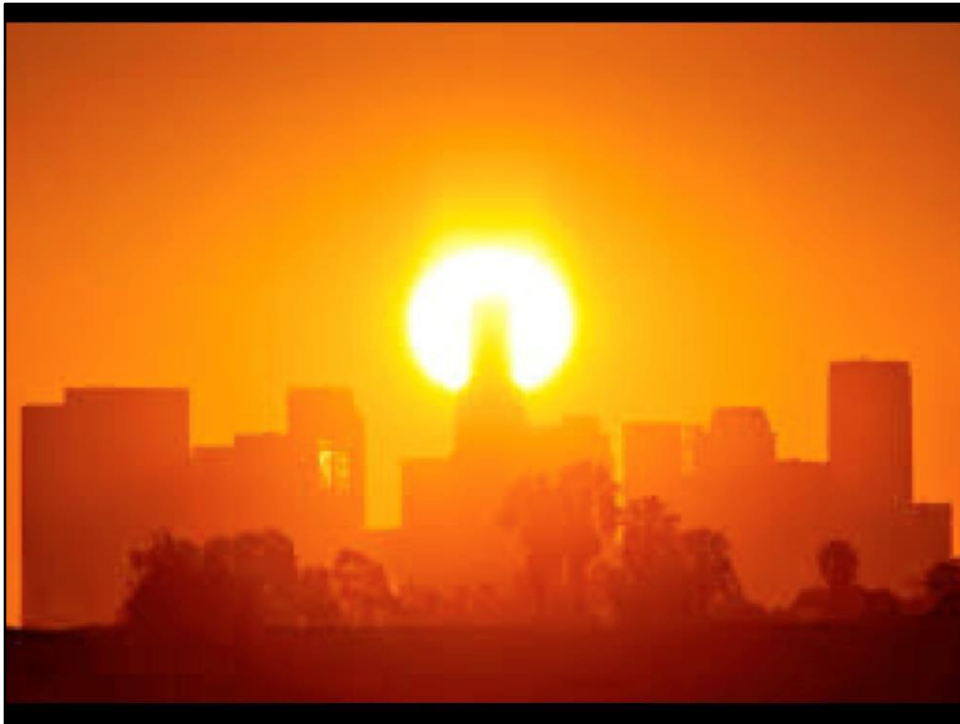
CHRONIC CLIMATE CONDITIONS:

SLIDE 7 SEA LEVEL RISE - -TENS OF millions of Americans live on the coastline.

"Without a sharp reduction in greenhouse gas emissions," Jim Hansen says

"Global sea level is likely to increase 10 – 13 feet in as few as 50 years. *Parts of our coastal cities would still be sticking above the water, but you couldn't live there.*"

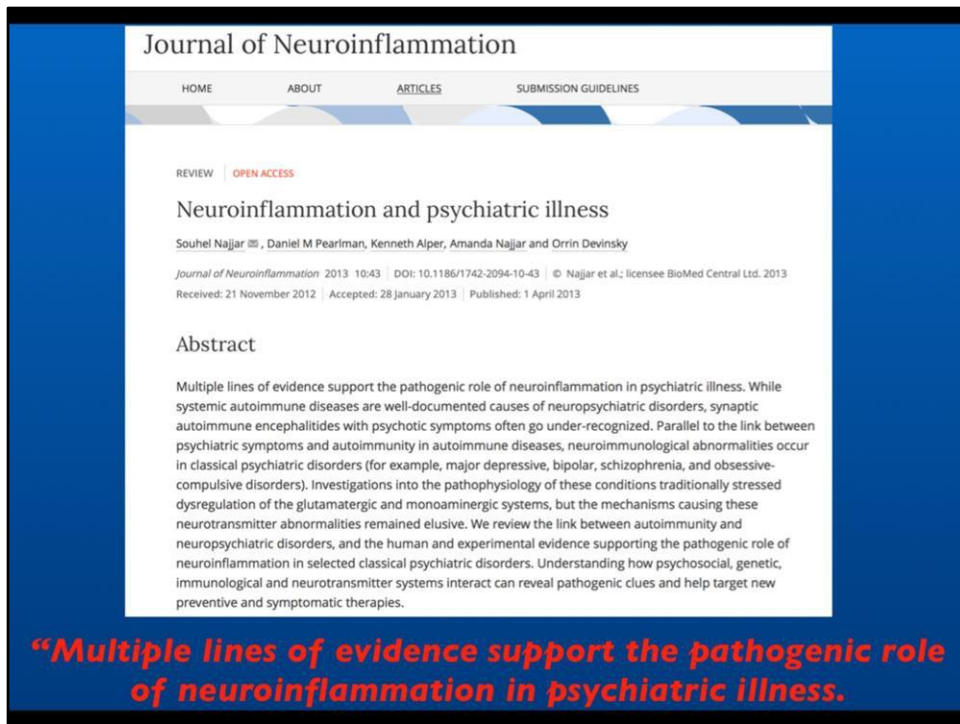
Small island nations will be swallowed up.



CHRONIC CLIMATE CONDITIONS:

SLIDE 8 AIR POLLUTION is primarily the result of burning fossil fuels; Higher temperatures speed up the chemical reactions that form it.

In addition to the links to Asthma/ cancers – (lung, ovarian, liver) respiratory illnesses, heart disease - changes in DNA that narrow coronary arteries and trigger heart attacks, atrial fibrillation; life-long decreased lung volume in children, obesity, diabetes, spiking rates of autism and auto-immune disorders...



CHRONIC CLIMATE CONDITIONS:

SLIDE 9 POLLUTED AIR IS ALSO A CAUSE OF INFLAMMATION of brain tissue. Ultra-fine particulate matter, that's less than 1 micron, (not the 2.5 micron you might be thinking of) crosses directly into the brain from the nose when we breathe -- causing inflammatory processes that are linked to dementia, Parkinson's, ALS. Multiple lines of evidence support the role of neuro-inflammation in classic psychiatric illness - major depressive disorders, bipolar disorder, schizophrenia, obsessive-compulsive disorders.

How much ultrafine particulate matter, is in the air? Regulations to measure it do not exist. Yet ultra-fine particulate matter makes up the bulk of the particles in the air and is taken to be much more hazardous to our health.

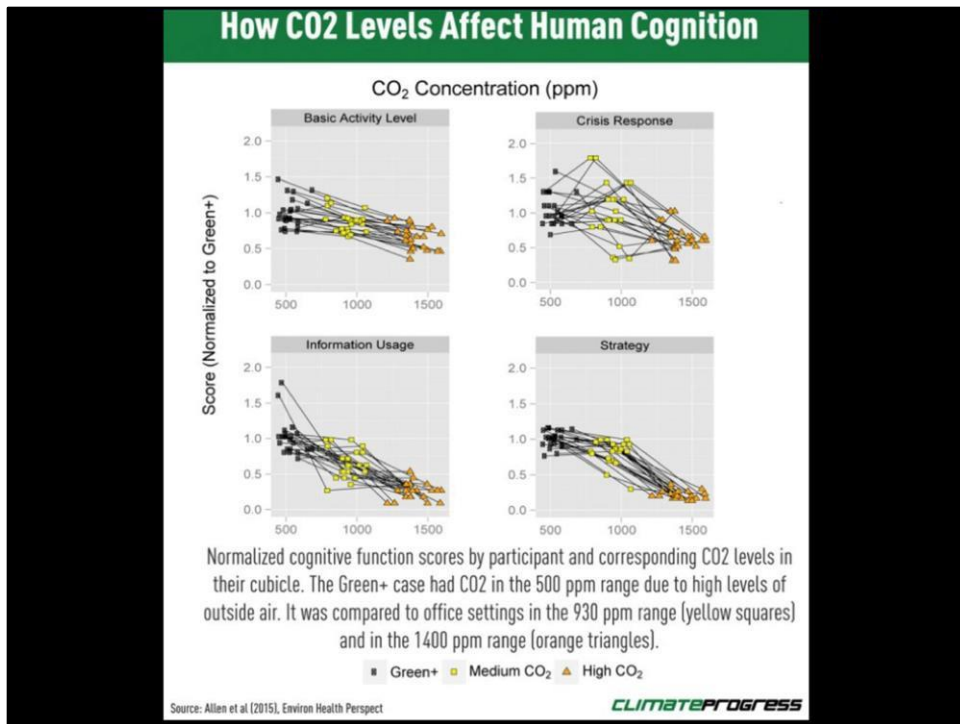
Emergency room visits for anxiety and suicide threats are significantly higher on days with poor air quality.

The [American Psychological Association reported](#) children exposed to small particles of chemicals in the air were more likely to have symptoms of anxiety or depression.

We know that even **low levels of pollution** in Sweden - primarily from traffic - are associated with an increased risk of mental illness in children. The researcher who led

the study said "I would be worried myself if I lived in an area with high air pollution.

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CHRONIC CLIMATE CONDITIONS:

SLIDE 10 HIGHER CONCENTRATIONS OF CO₂ *alone* impair cognition: Exposing workers to increasing levels of CO₂ has significant impact on their cognitive functioning. The testing, at INDOOR concentrations to which Americans are frequently exposed, shows the most serious decline in our ability to think strategically, to use information, and to respond to a crisis.



SLIDE 11 “NOT EVERYTHING THAT COUNTS CAN BE COUNTED”

It is the inchoate, insidious, complex, and unconscious psychological states driven by climate trauma - not lending themselves to studies and precise numbers - that are the most profoundly damaging and drive systemic emotional conditions society will find difficult to treat and surmount.

When it comes to the reach of emotional pain, as poet John Dunne said, “No man is an Island”. The waves of injury from climate trauma and frustration from inaction are already reverberating across families, the workplace, our communities - cumulatively taking a toll on the national mood. Repercussions from a stressed-out national mood affects our economy, our politics, our relations with other countries, It shapes our culture and increasingly affects how we treat each other.

Nations are like families – After 25 years in practice I can aver that children who grow up feeling they were neglected can be deeply damaged. The belief that they have been cheated and mistreated can last a life time and leave them feeling resentful, the sense of abandonment interfering with their own sense of commitment, fostering a defeatist attitude, making them unwilling to take initiative themselves.

Future generations will know that they were neglected if proper action on climate is not taken. It begs the question: ... Will they be different?

I can see this one coming –a Climate Crisis Victimization Syndrome – where instead **of** making every effort to rise above the psychological pain of the climate crisis – everything is instead blamed on it, stifling personal growth.

Intentional vs accidental harm – When disasters are no longer experienced solely as acts of god or nature but derive from the behavior of humans - it is much tougher on us - because what happens from **intentional negligence** is harder to put behind us than what happens accidentally.

The rise of an anxious world -

We can be anxious and not know why, we can be anxious and not know it. Sometimes anxiety is manifested as anger or another emotion or state that doesn't even suggest the root cause. We can be anxious and give it the wrong name – often if the real source is especially unsettling. We don't always recognize the psychological toll that anxiety is taking on us.

Climate change evokes a profound sense of anxiety - from feelings of powerlessness.

People typically try to repress – that is make unconscious, what makes us feel powerless. Most of us can accept knowing that we are worried about climate, and don't repress it entirely because we can accept that it is natural to feel vulnerable. Instead of accepting the fear that comes from feeling vulnerable, deniers tend to experience the fear as emasculating – for a variety of reasons these men, especially, are trying to offset the fear that deep down inside only “girlie men” are afraid. Their outward display, denial, is overcompensation. A therapeutic approach, generally to help deniers, would be to address the personal insecurities that stand in the way of accepting reality. More can be said about this.

Much of the violence in the world can be explained by unaddressed anxiety emanating from the feeling of powerlessness.

Whether we know it or not, whether we accept it or not – there isn't the slightest shred of a doubt in my mind that we are already full of anxiety about climate change – and that it is driving us towards a world increasingly on edge.

Will we be in a growing state of fear from diminished productivity, distrust of each other, conflict between haves and have nots, callousness/numbness in our response to suffering – “compassion fatigue”, an alienated citizenry? Will we have the opportunity to innovate or work our way out of this?



ECOSYSTEMS disrupted: you can't have healthy individuals on a sick planet:

SLIDE 12 BIODIVERSITY loss – both animals and plants:

In the last 50 years, wildlife, it has been estimated, has declined by 40 %.

Professionals specializing in the effects of climate on animals or habitat are themselves no strangers to trauma – experts cite the loss of career long passions -- the coral reef that has been destroyed by bleaching, the frog species believed to be extinct.

In our fight for the climate, it has been said that we should think of people not polar bears - a legitimate reminder that privileged groups overlook the environmental injustices affecting people in places where socio economic challenges impede the ability to be heard.

But animals are central to our existence.

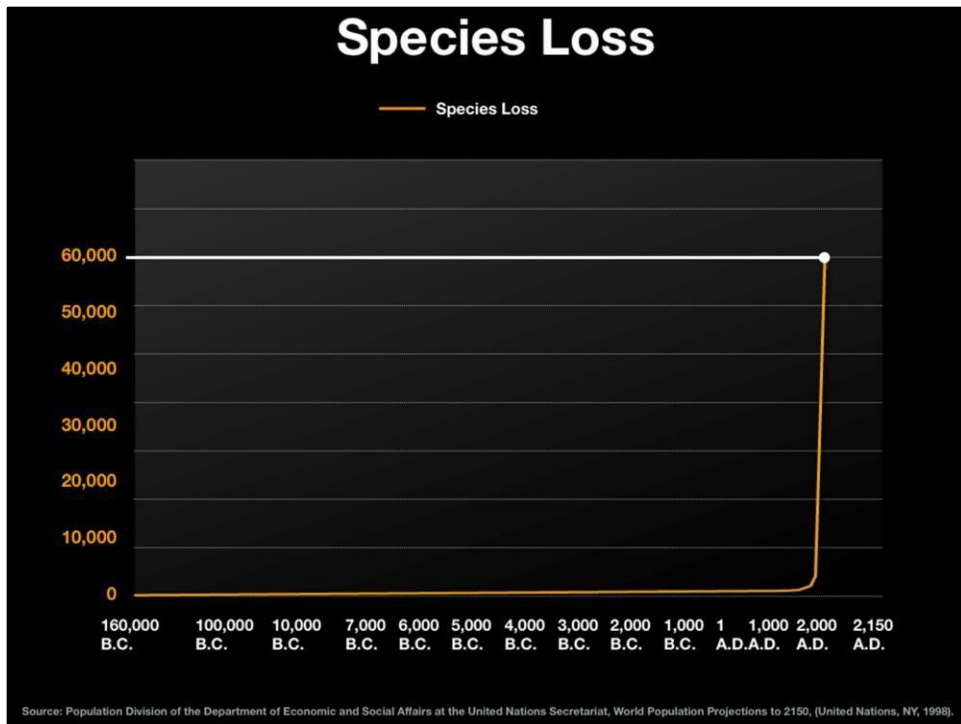
We know that our special bond with *pets* has enormous psychological benefits – lowering anxiety, sensitivity to pain, aggression, improving learning, empathy, social confidence, and that this bond lowers blood pressure and heart rate, and boosts the immune system. One biologic messenger is likely Oxytocin, the human bonding

hormone associated with fostering trust and altruism.

Studies show that green space in which wild animals live provides the same physical and psychological benefits that having pets does. After spending time in nature, we are more generous. Shirin yoku, “forest bathing” is a movement in Japan dedicated to providing city dwellers with the healing effects of green space.

We are risking profound psychosocial damage as we stray from the ecosystems **we were evolved to share** with other species.

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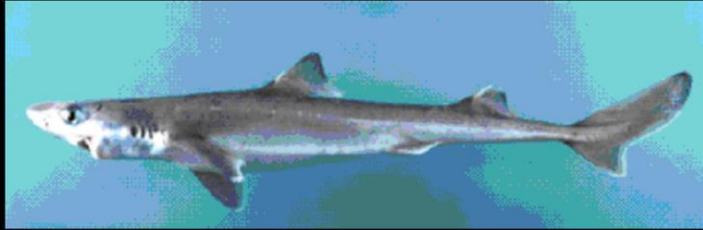
SLIDE 13 IT MAY BE 30% BUT UP TO 50% OF SPECIES ARE HEADED TOWARDS EXTINCTION BY MID-CENTURY.

Some of humanity's most troubling health problems could become treatable by studying our animal relatives. Below are examples of animals that carry a treasure trove of potentially lifesaving information and are at risk specifically or are from a class at risk. From the work of Nobel Laureate Eric Chivian and Ari Bernstein.



Antimicrobials

SLIDE 14 THE AFRICAN CLAWED FROG produces antimicrobials that make them immune to common human infections. They could be the key that unlocks a whole new class of antibiotics – not bad in an era where bacteria are increasingly becoming resistant.



Squalamines

SLIDE 15 DOG SHARKS secrete Squalamines that can cut off the blood supply to ovarian and lung cancers – and maybe other cancers.



Pain Killers

SLIDE 16 CONE SNAILS secrete substances that have 1000 times the pain killing capacity of morphine! - And are already being used in the spinal fluid of people with intractable pain.

They are threatened by coral reef die offs.



Regeneration

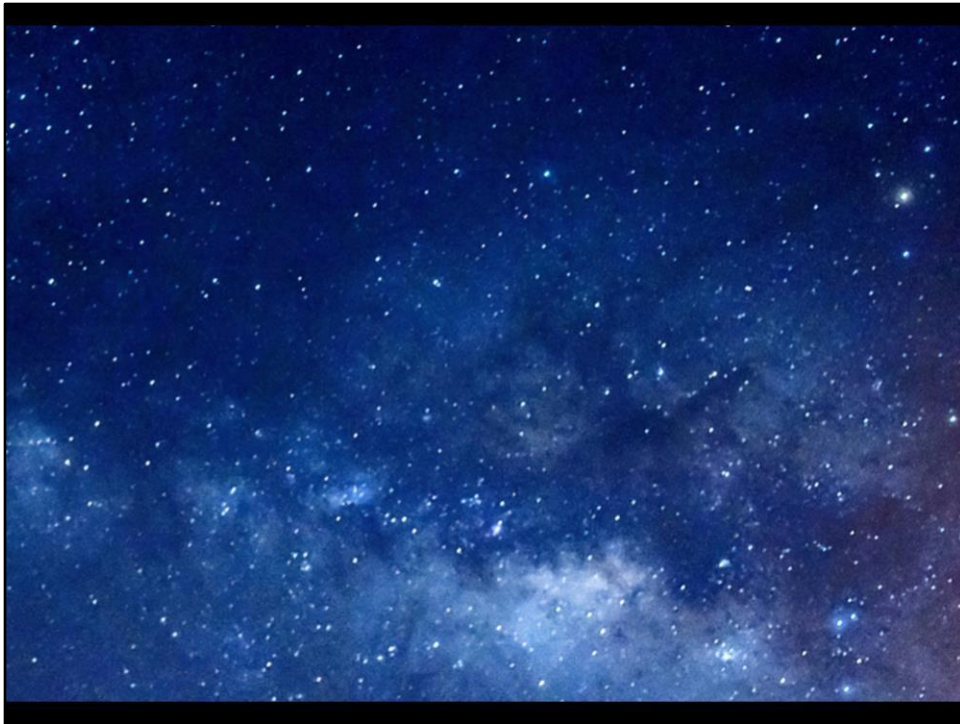
SLIDE 17 SALAMANDERS: cut off a limb and they grow a new one - we know this capacity is hidden somewhere in OUR DNA – but where?



Osteoporosis Type II Diabetes

SLIDE 18 POLAR BEARS hibernate and lose calcium – (Think treating osteoporosis) - when they are back on their feet calcium goes right back on their bones. How does THAT work (it doesn't happen in captivity)?

It has become a race against time to get the data before some of these species are lost.



SLIDE 19 OUR FOOD SUPPLY AT RISK

Climate change leads to food insecurity by reducing the amount and quality of the food we can produce.

Every 1 degree centigrade rise in T results in an average 10% decline in food and ag output. The price of food goes up. In parts of the world where 80% of income goes for food, shortages and higher prices upend communities with fighting, rationing and the stress of hunger

High levels of CO₂ lower nutrients such as iron, zinc and protein in exactly the crops the world's poor mostly depend on: Rice, wheat, maize, and soybeans.

Food insecurity destabilizes governments, damages our health and harms our communities. The masses of refugees in the throes of the worst drought in 900 years were on the road in Syria looking for food in places that didn't want them and wouldn't help them - tripping the geopolitical wire that brought us the catastrophe we see today.

OCEANS: High levels of CO₂ dissolve into our oceans causing acidification – impeding the growth of key species of the food web including the oceans “nursery”, coral reefs. More than a billion people rely on food from the ocean as their primary source of protein.

By AMY KRAFT CBS NEWS January 21, 2016, 3:32 PM

Algae bloom toxin linked to Alzheimer's, other diseases



Satellite image of a toxic algae bloom in Lake Erie in 2011, one of the worst blooms in recent years. / MERIS/ESA, PROCESSED BY NOAA/NOS/NCCOS

SLIDE 20 BACTERIA FROM ALGAL BLOOMS associated with climate change produce a **neurotoxin - BMAA** – (β -Methylamino-L-alanine) that enters our food chain. The brain tissue of humans exposed to this neurotoxin show some of the same changes that are seen in Alzheimer's, ALS and Parkinson's. BMAA is found in commercially marketed sea food.



SLIDE 21 THREATS TO WORLD ORDER

Though the result of multiple forces, Climate change is today a root cause of

1. the Explosion of refugees looking for safety
2. Destabilized regions – as resources become scarcer the competition for them becomes fiercer. Fragile nations can fail.
3. in Europe a sharp turn to the far R politically; I use to say, “We shall see here in America”. Now we have our answer.

In the US - with 5% of the world’s population - we have put up 25% of the world’s GHG.

Jihadists are already using global warming as a rallying cry against us. We may be in denial – but they are not.

Papers swept up during the storm of Osama bin Laden’s compound in Abbottabad and earlier letters show his focus on American’s role in causing climate change.

"You have destroyed nature with your industrial waste and gases more than any other

nation in history.

These are tough words to hear from a FIEND with so much blood on his hands, but how do we answer this?

Will we become pariahs?

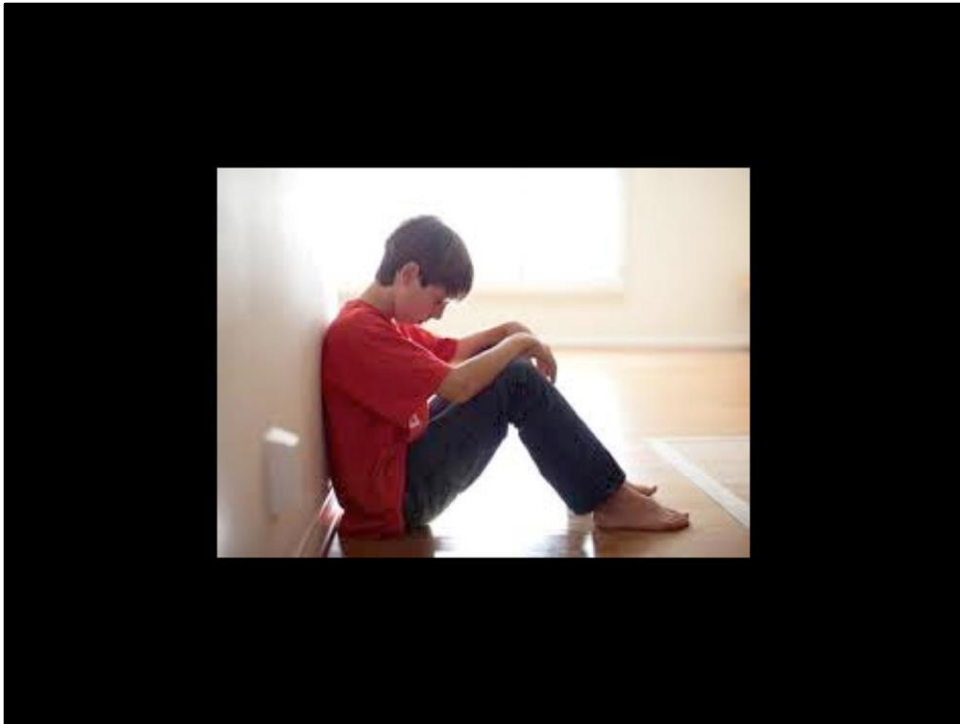
As a former CIA profiler - I fear for our democratic way of life:

The rise of Authoritarian government: In times of peril and scarcity, people turn to what they perceive as strong leaders to protect them. They are willing to give up their freedoms in exchange for *perceived* security. Heaven help us from the tyrants this can unleash.

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SLIDE 22 THE EXPERIENCES OF CITIZENS STRANDED AT THE SUPER DOME in New Orleans in the days after Katrina are an example of how quickly our systems can be overwhelmed and our faith in them turned upside down. Faith in a functional government is the sine qua non of stable society.



SLIDE 23 SPECIAL POPULATION AT RISK are children the elderly, the sick, the disabled, the mentally ill, the poor, those living in the bull's eye of disaster prone areas, along coastlines and rivers, "tornado alleys", inner cities with the "heat island" effect; First Responders; Climate Cassandras who suffer from "pre"-traumatic stress disorder", in the grip of images of future disasters they can't put out of their minds.

In the first published "climate change delusion" a 17-year-old Australian boy had to be hospitalized for refusing to drink water - believing it would cause millions in his drought-ridden country to die of thirst. The Melbourne Children's Hospital doctor who treated him told me he has a clinic full of children with climate anxieties.

"Transgenerational epigenetic inheritance"

Carried by an "on/off" switch – – the activation of a human gene for stress in the face of trauma can be passed onto succeeding generations – compounding the toll.

Some Taboo Issues:

Aggression

When we put people in harm's way there is a name for it: It's called aggression. Inaction on climate is a display of aggression towards future generations.

What we eat Transitioning to a low carbon plant based diet is the only way "to save the world from hunger, fuel shortages and climate change". The United Nations

Environmental program has declared *essential* a global shift towards a plant-based diet.

Traveling by air: Acknowledging the tremendous carbon costs of airline travel climate communication specialist George Marshall points out – we would have to save nearly 800,000 plastic bags to offset a one-way trip from Australia to the UK.

Environmental Grief

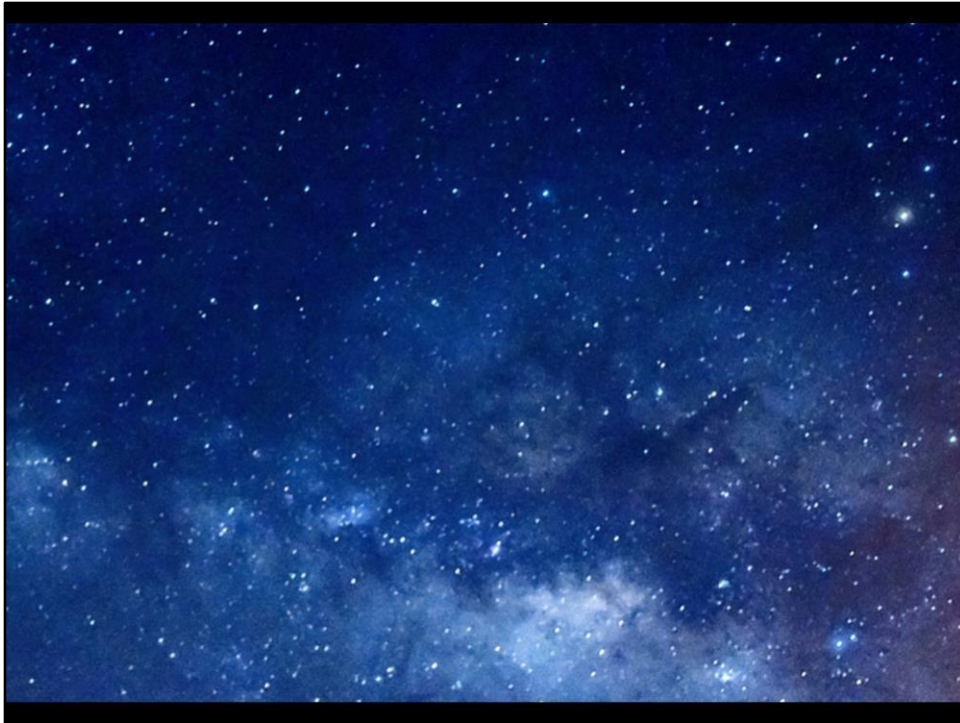
A new term has been coined: “Solastalgia” – to describe the pain of seeing lands that once gave the treasured sense of “home” now lost or irreparably damaged.

Should I have a baby is a question increasingly being asked by young people worried about the carbon costs of bringing another person into the world.

A doctoral student in Anthropology at Stanford and one of his friends whom I am in contact with have been discussing “rational suicide” in the face of climate and carbon impacts.

And the ultimate Psychosocial impact: As we register these warnings and ponder the overwhelming beauty and complexity of nature, inspiring us with awe and wonder, what, finally, is the cost of all of this to our souls?

In my years as a psychiatrist I have seen children suffer physically and emotionally at the hands of adults. As we look over recent events in our nation, when we consider how much physical and emotional suffering will come to our children - how can ***inaction on climate*** be interpreted as anything other than child abuse?



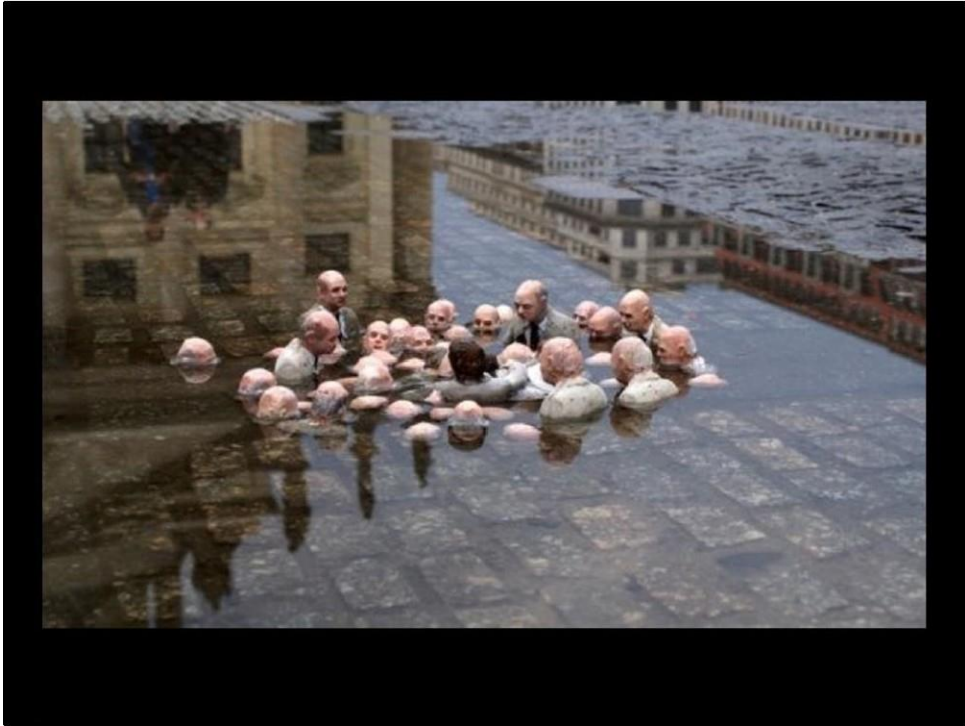
SLIDE 24 ENTITLEMENT

Though well-off members of society sometimes rail at financial entitlements given to those on the lower end of the socio-economic totem pole, the entitlement that is the most unjust is the one rarely mentioned: leading a high carbon lifestyle. Ten percent of the world's richest emit 50% of the world's green-house gases.

Oxford Sociologist Stein Ringen warned in 2014 that the UK and the US were in trouble – because of multiple stressors - the gap between the haves and the have nots, corruption (money for political contributions in exchange for policy votes) and complacency. When the lights went out in Athens, Ringen warned, it was 2000 years before constitutional democracy again emerged. Democracy is not a default from of government, social justice is never guaranteed. As Climate trauma exacerbates these conditions, we must steel ourselves with resolve and resilience - because in this critical moment in the history of civilization - we are the ones who are here.



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