

The Moment is Urgent A 12 Year Moment



Pay attention to the flow of waters

**Pay attention to the integrity of
the waters flowing**

Pay attention to where the waters are willed to flow

Pay attention to the state of belief

Pay attention to the belief stated

Pay attention to the flow of belief

and the willing of desire



The Center for the Study of the Force Majeure

There is a belief
to be abandoned as too costly
It is the belief that the life web
can ruthlessly be exploited and
landscapes can be exhausted
polluted from aquifer to topsoil
then revived if or when profitable
It is the belief in extraction squared
that leads to extraction cubed
We are seeing a globally legalized
Force Majeure
Pay attention
to the extreme cost
of extreme belief

The Force Majeure

The Center for the Study of the Force Majeure

was founded by Newton and Helen Harrison in 2007. It is a freestanding education and research center based at the University of California at Santa Cruz that brings together artists and scientists to design and catalyze the development of ecosystem-adaptation projects in critical regions around the world to respond to **climate change**.

We work at the scale at which issues present, using a focus on “pre-emptive planning”, i.e. strategies that forestall, adapt to or mitigate the challenges emerging over the next 50–100 years.

Force Majeure, the legal term embedded in the name, when framed ecologically refers to the uncontrolled impact of human-accelerated global warming and whole-systems stress produced by the vast industrial processes of extraction, production, and CO₂ generation.

For the past 200 years ‘free’ fossil carbon has allowed us as a species to separate ourselves from nature and the global web that supports all life on the planet. That same fossil carbon has given rise to a series of systems, in agriculture, forestry, urban development, transportation, technology and overall social organization that rely on that energy along with an enormous intellectual apparatus designed to rationalize our reckless behavior. The sheer scale of this transformation has impoverished



all other global processes. We are on the edge of system collapse across almost every measurable axis. As artists, our response to the crisis we face is to honor the web and find ways to bring humans back into the natural systems of which we are a part. We address this imminent collapse by intentionally reintroducing complexity to systems impoverished by the inexorable simplifications demanded by modern industrial practice. We seek to provoke action and engagement that counters business as usual, to catalyze new thinking and reshape the inevitable social, political and economic responses towards bringing balance back into the web of life.

Global Mapping Exhibit, 2013

Among the leading pioneers of the ecological art movement over the past 45 years, the works of the Harrisons have been considered as artworks, as models of meaning and as tested theories on how to regenerate the crucial and endangered repositories of our environment. Working alongside biologists, ecologists, architects, governments and urban planners, Helen and Newton Harrison have enacted multiple large-scale ecological transformations globally, creating invaluable protections, research and cultural heritage for ecosystems and civil societies.

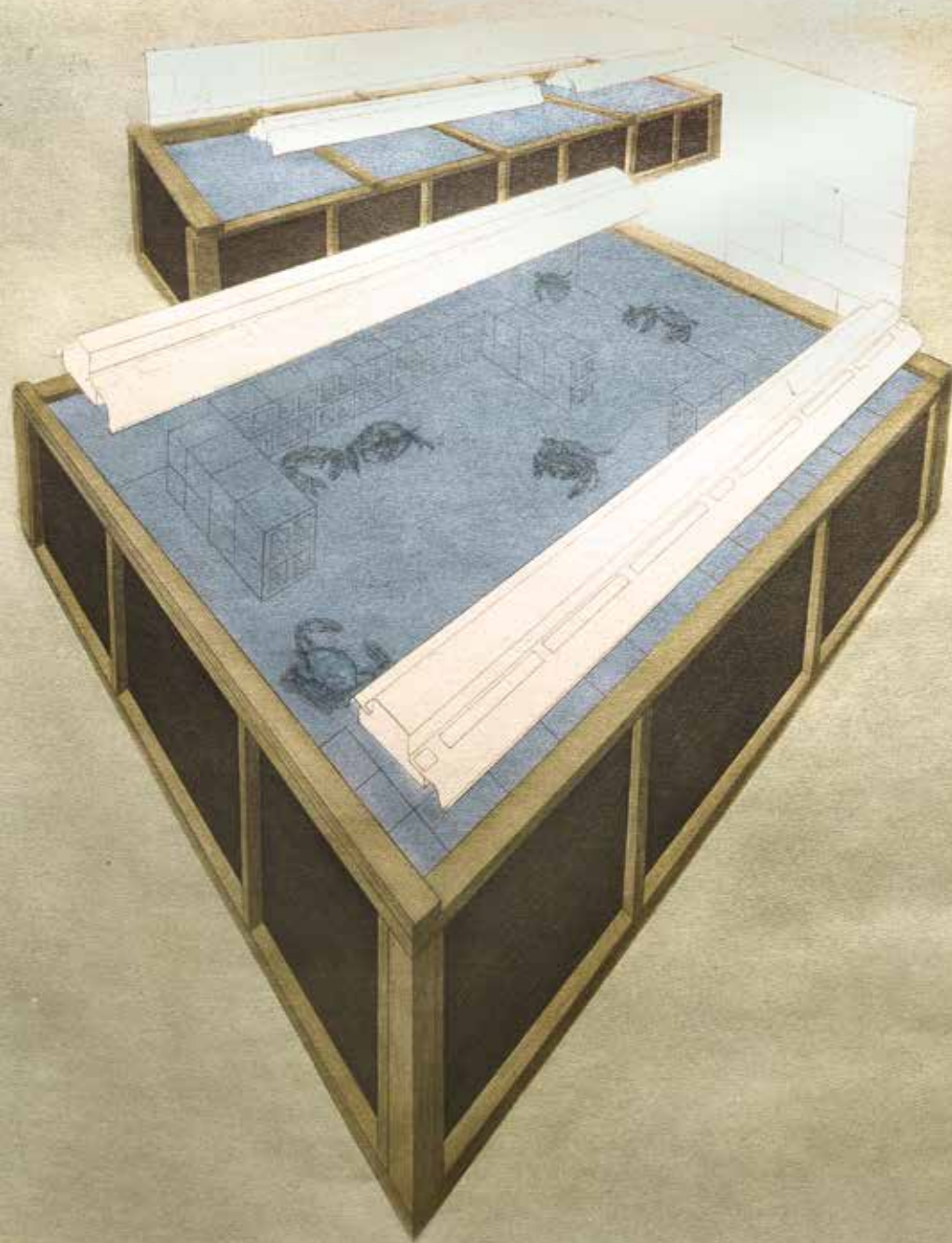
Why us, why now?

Everything within the vast web of life experiences limits and boundaries, either due to predators, other species or the experience of a boundary condition such as a mountain or a body of water. Humans have made themselves the exception to this principle, which has sustained and governed the 3.5 billion years of biodiversity that enriches this planet and all life within it. The life web may now be just

beginning to establish limits to human growth. These limits appear in reduced birth rates due to pollution, in reduced food supply due to drought and soon they will appear in the increase in bacteria and viruses, which more rapidly develop immunities to the cures we invent. We are careful in how we use science. Sometimes we generate our own, sometimes we commission it from others. In a larger sense, we at the Center are aware that many of the discoveries of scientists have been put to work by businesses and governance in such a way that the life web has been damaged. We believe that the deepest resolution of our ecological problems will come from studying the way the life web itself has met catastrophe over billions of years. We argue for urgency now because the changes humans have caused in the environment are happening far more rapidly than the life web can adapt. There is no greater urgency than attending to the wellbeing of the life web. None. This is the sole work of our center. It is at this urgent moment that we need to find support to put in place the counterforces we propose.



The Book of the Lagoons: *The Seventh Lagoon – The Ring of Fire – The Ring of Water*, 1979



Development of a Commercial
Aquaculture System for the Crab
Scylla serrata (Forster)

A series of photographs of the lagoon and a detailed plan view of the lagoon are shown.

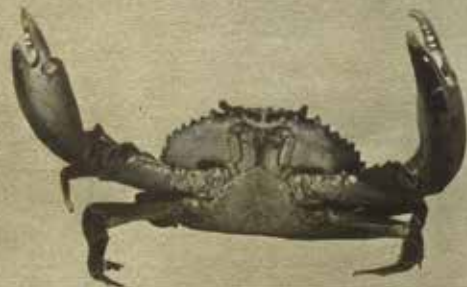
The lagoon was designed to be a series of rectangular tanks, each 10m x 10m, with a depth of 1.5m. The tanks were arranged in a grid pattern, with a central channel for water circulation. The lagoon was built on a concrete base, and the tanks were constructed from wood.

The lagoon was designed to be a self-sustaining system, with a natural flow of water from the sea into the lagoon. The lagoon was designed to be a series of rectangular tanks, each 10m x 10m, with a depth of 1.5m. The tanks were arranged in a grid pattern, with a central channel for water circulation. The lagoon was built on a concrete base, and the tanks were constructed from wood.

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and because the crabs grow
so well in the tanks I
began to dream a crab-acre
and others interested began
to dream it with me



Shrimp farm at the museum Les Abattoirs
in Toulouse, France, 2002

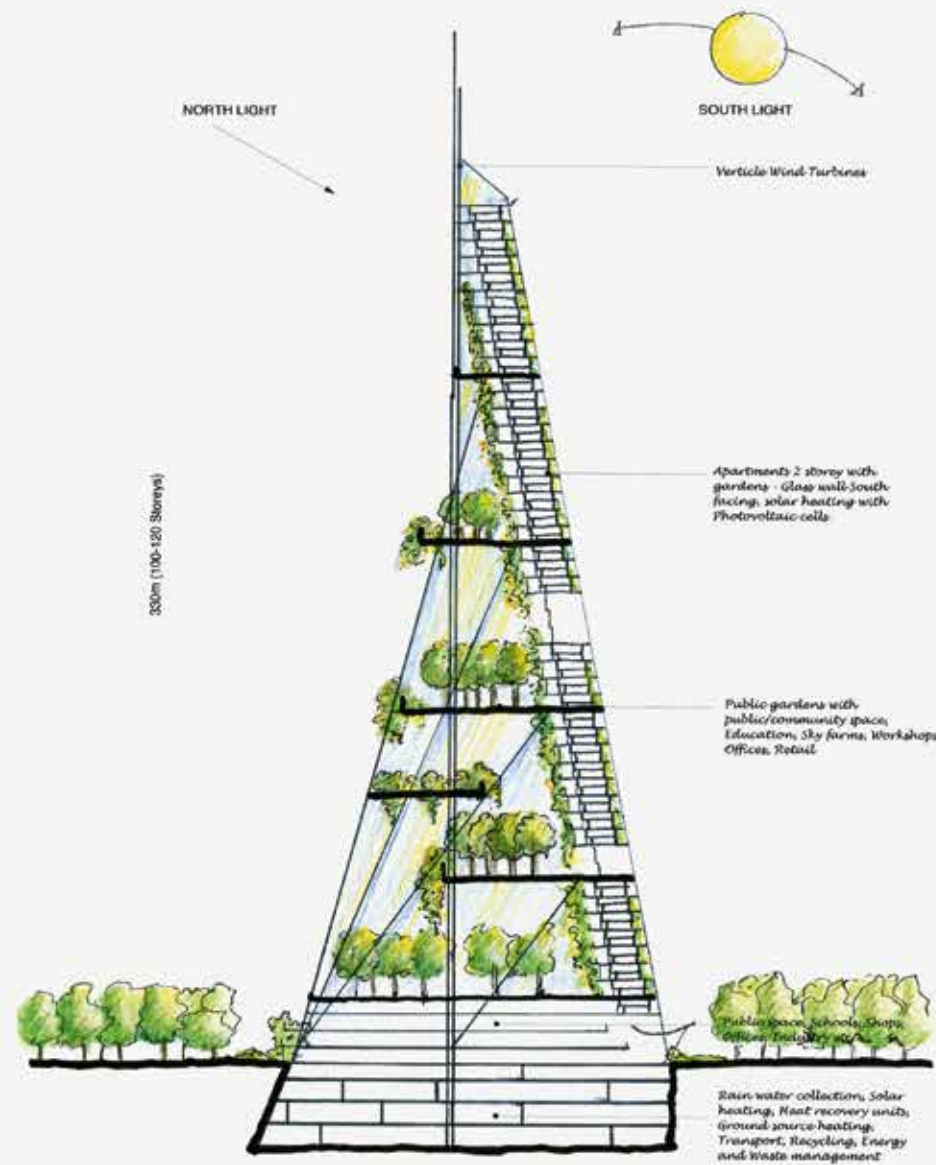


The Lagoon Cycle, 1974–1984
The Book of the Lagoons: The Second Lagoon – Sea Grant



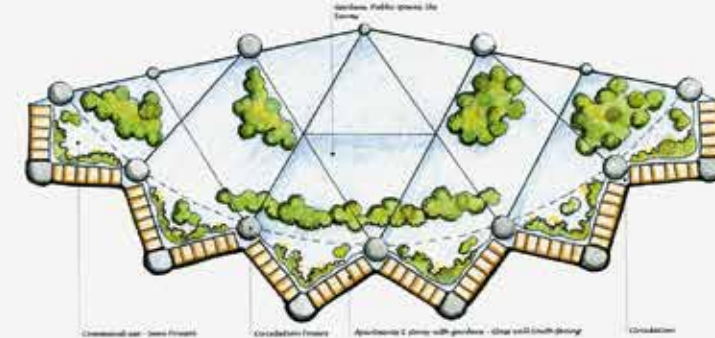
Portable Orchard installation
Walker Museum of Art, Minneapolis, 2016

Sky Gardens



Greenhouse Britain
2008 | 2009

We propose a bold experiment answering the question can intense population density and complex biodiversity coexist within a unified field Imagine that ecologically provident culturally appropriate high-rise dwellings some of which are already being designed for people in large numbers behaving as a high-rise village each having its own garden each garden hanging in the sky



The Global Commons

We see the web of life as a system of commons. We understand the commons as the air, the waters, the forests, the topsoil and the mind. Our great commons, which are now under immense threat are in desperate need of our support, care and protection.

The web of life, which encompasses all of the commons and all life on this planet are interrelated systems, whose health and stability depend on each other. In order to nurture and rehabilitate the atmosphere, we must also nurture and rehabilitate our oceans. We cannot achieve one without the other.

Atmosphere

The Atmospheric Commons contains the air we breathe and transports much of the water we drink. Air holds and stabilizes the biochemistry of the planet. When air destabilizes, so do all living systems affecting the basis for life continuing on the planet. Oxygen production is down; carbon production is up to a degree that reaches far beyond the implications of global warming, which in itself stresses all systems

Waters

Water is essential to all life on the planet. Oceans cover almost $\frac{3}{4}$ of the surface area and contain over 95% of all water on the planet.

Oceans are increasing in temperature and acidity, which in turn increases sea-level rise and pushes overall productivity downward.

Forests

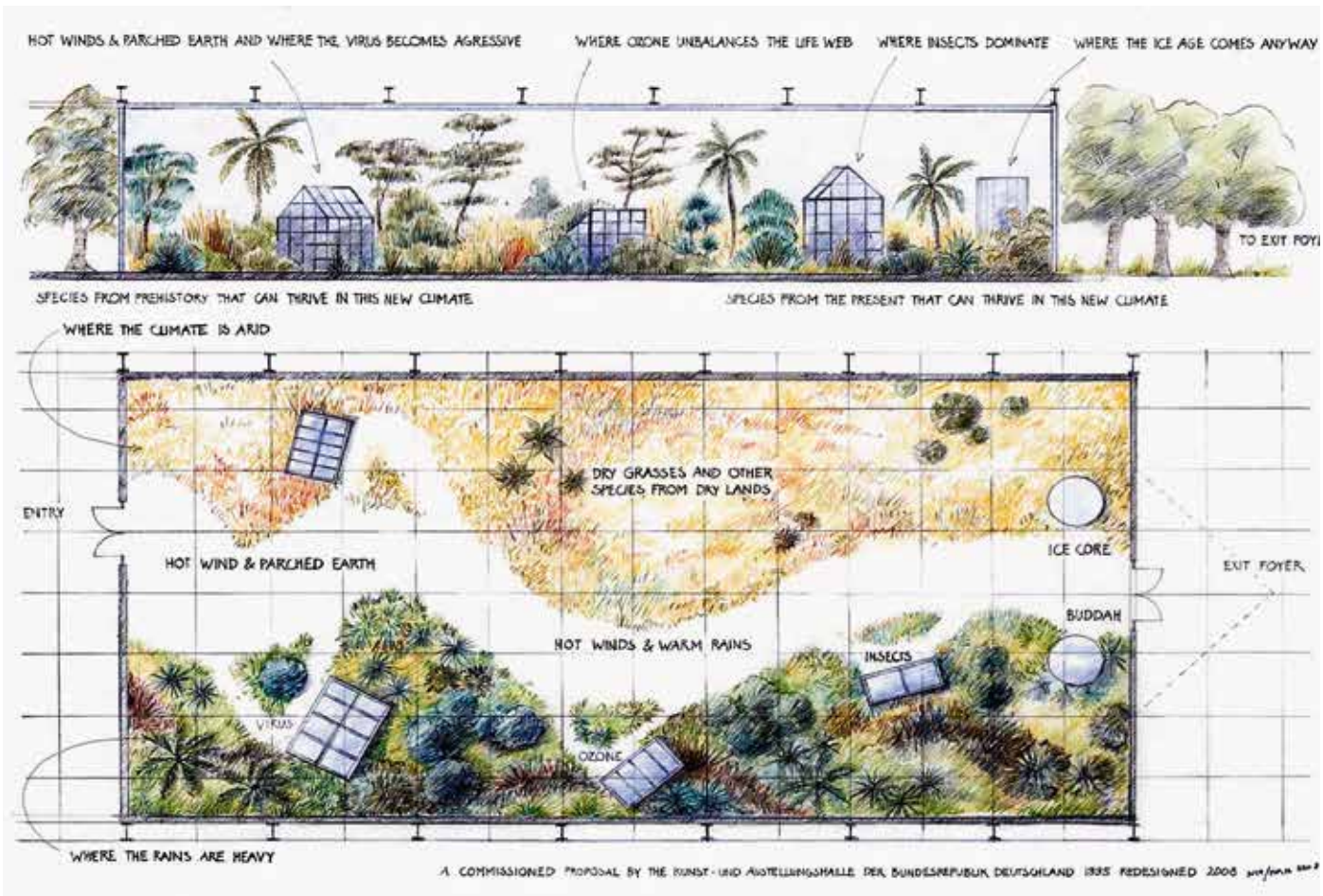
In the largest sense, forests are the lungs of the planet, transforming CO₂ into oxygen, stabilizing the hydrologic cycle and maintaining critical watersheds. In the current era, forests have been cut by 80% globally, dramatically reducing overall biodiversity, as well as the forest's ability to regulate weather and atmospheric constancy. Furthermore, forests hold, protect and generate biodiversity which is foundational to our continued existence.

Topsoil

Topsoil is all earth from which life springs. We are losing topsoil globally at rates far surpassing anything in the scientific record, causing our current long-term depression in soil productivity and dramatically increasing desertification worldwide. Current industrial agricultural practices on the 12 million square miles of arable land globally have reduced the topsoil's ability to hold water and sequester carbon. Centuries of relentless monoculture have largely replaced natural systems. Without rapid remediation, global loss of topsoil raises doubt about our ability to continue, particularly to feed ourselves.

Mind

A collective community of agreement on repairing, regenerating and nurturing the life web itself. A global commons of the mind does not yet exist; though elements of it are actively developing. It is increasingly necessary for the human race to reverse the damage that is done; in essence a global collective agreement.



THE GARDEN OF HOT WINDS AND WARM RAINS

IT IS A MULTI-LAYERED STORY TOLD WITH ARTIFACTS, MEDIA EVENTS, TEXTS, AND LIVING MATERIALS, WHICH ALL TOGETHER ENGAGE THE PROBABLE GREENHOUSE FUTURE DIRECTLY. IT IS A WORK OF ART THAT WILL BE GARDEN, PREDICTION, AND PROMENADE, A VOYAGE OF SORTS, MAINLY ENCLOSED IN A GLASS "GREENHOUSE" TO MAINTAIN A CLIMATE CONSISTENT WITH THE SUPPOSED 5 TO 6 DEGREE CENTIGRADE RISE IN TEMPERATURE OVER THE NEXT 100-150 YEARS. THUS THE GLASS HOUSE BECOMES THE VEHICLE FOR MAKING THE PHENOMENON OF THE GREENHOUSE EFFECT AND CERTAIN OF THE POSSIBLE FUTURES THAT IT WILL ENGENER, DIRECTLY ACCESSIBLE TO THE HUMAN SENSES.

THE VISITOR IS TAKEN THROUGH A NUMBER OF INSTALLATIONS THAT COMPRISE THE NARRATIVE. THE STAGE SET FOR THIS IS A SERIES OF POSSIBLE FUTURES THAT HAVE THEIR SOURCES IN SUCH CONCERNS AS: THE GREENHOUSE EFFECT, THE ENDANGERING OF THE FORESTS OF THE WORLD, THE REPLACEMENT OF FORESTS AND MEADOWS BY A MONOLITHIC MONO-CULTURAL AGRICULTURE AND THE VAST LOSS OF BIO-DIVERSITY IN THE OCEANIC AND TERRESTRIAL ECO-SYSTEMS.

THE TWO MAIN INSTALLATIONS WILL SHOW A SUBTROPICAL FUTURE CLIMATE SUCH AS MIGHT EXIST IN ANY TEMPERATE CLIMATE, AS THE GREENHOUSE EFFECT BECOMES MORE EVIDENT. BOTH THESE FUTURES ASSUME THAT THE WEATHER HAS WARMED AND THE OCEANS HAVE RISEN. HOWEVER, ONE FUTURE REPRESENTS AN ARID WORLD AND THE OTHER A HUMID ONE WITH HEAVY RAINFALL. IN BOTH FUTURES THE INTRINSIC VALUE OF BIO-DIVERSITY IS RECOGNIZED.

THESE FUTURES WILL LOOK TO THE PAST AS WELL AS THE PRESENT FOR INFORMATION. THAT IS TO SAY THE FLORA WILL BE DRAWN FROM

THE MEMBERS, OR THEIR EXISTING RELATIVES, OF THE LIFE WEB THAT PREVAILED DURING PERIODS OF EQUIVALENT TEMPERATURE IN THE PLEISTOCENE ERA, THE TIME BEFORE THE LAST GREAT GLACIATION THAT RESULTED IN A MASSIVE LOSS OF SPECIES. AND SPECIES WILL BE DRAWN FROM PLACES THAT ARE NOW EXPERIENCING CLIMATE CONDITIONS EQUIVALENT TO THOSE THAT ARE PREDICTED.

THE TASK WE SET FOR THIS WORK IS THE EXPLORATION OF ECO-CULTURAL COLLABORATIONS THAT WOULD MAKE FOR A FUTURE NO LONGER BASED ON EXTRACTION. THUS, BOTH HUMID AND ARID GARDENS WILL MODEL THE PRODUCTION OF FOOD FOR HUMAN CONSUMPTION, WHILE SIMULTANEOUSLY CREATING, ENHANCING AND SUSTAINING A COMPLEX INTERDEPENDENT ECOSYSTEM. THE PRIMARY OBJECTIVE BEING THAT THE HARVEST WILL PRESERVE THE SYSTEM RATHER THAN DEplete IT.

THEREFORE THESE GARDENS LOOK AT WHAT A FUTURE COULD BE LIKE IF CONSCIOUS, MUTUALLY BENEFICIAL COLLABORATIONS BETWEEN HUMAN CULTURES (CIVILIZATIONS IN ALL THEIR COMPLEXITY) AND THE CULTURES OF NATURE (THE LIFE WEBS COMPLICATING AND DIVERSIFYING UP TO THE SPACE AND ENERGY AVAILABLE) BECAME A NORM.

HOWEVER, WITHIN THESE POSITIVE FUTURES, A SERIES OF UNCOMFORTABLE, SOMETIMES SHOCKING Glimpses OF OTHER POSSIBLE FUTURES WILL APPEAR IN SMALL GREENHOUSES. IN SUM, THIS WILL BE A PHYSICAL AND METAPHORICAL EXCURSION THROUGH POSSIBLE FUTURES WHERE THE VISITORS WILL EXPERIENCE THE EXPECTED AND THE TOTALLY SURPRISING, THE HUMOROUS, THE TRAGIC AND EMPIRICAL AS WELL AS THE PLAYFULL.

The counterforce we envision will permit a culturally generated acceleration of adaptation behaviors at great scale operating at a parallel rate to the climate force generated by human activity setting the stage for adapting strategies that will assist the migration of our own species and those who are not ourselves who are co-equally endangered by the threat of mass extinction into zones of greater safety tuning to and over time in concert with the Force Majeure

Counterforce

What is a Counterforce?

The life web is under deep stress and requires regeneration at great scale. Counterforce at this scale involves the healing of all global commons, by rebalancing the atmosphere, de-acidifying the oceans, increasing the biodiversity holdings of our planet and rehydrating the increasingly drying and drought-stricken swaths of topsoil planet-wide.

The main counterforce within all of our planetary systems is the life web's ability to heal itself. Through supporting and gently nurturing these systems intelligently and intuitively, we can if careful create a planetary counterforce able to rehabilitate the life web and reduce climate shock now being experienced by multiple planetary systems.

Why we need a Counterforce?

We are in a self-crippling bind. Ecologically speaking, we've taken too many fish out of an already acidified ocean, we've cut down 80% of our forests, removing a vast amount of our planet's biodiversity, all while reducing oxygen in our cities and pumping a huge amount of ecologically unprocessable chemicals back into the system which sustains us.

We are also confronting a great illusion – a belief that if we make the world carbon neutral, business as usual can continue. This is not the case. We've extracted mass profits, but we have yet to reimburse our resource base. This is not simply an ethical obligation, this is critical to the survival of our species. Ultimately, the point is that the litany of climate issues we are facing, not least, the sixth mass extinction now upon us, will eliminate our ability to do business as we currently understand it.

The great wealth generator of energy on this planet is our sun. Industrial production based on fossil carbon will always cause a net loss in another part of the system, whereas healthy solar driven systems are self-continuing, self-evolving and benefit other systems.

To address the global problems associated with climate stress, we see it as imperative to redirect substantial resources to the issues.

Estimates range from 2%–5% of transnational value per annum for a period of 20–30 years.

Expensive? Perhaps.

Doable? Yes.

Absolutely critical? Definitely.

Local scale:
Future Gardens
 (1995 to present)



These are small-scale works we call **Future Gardens**. The concept is that every place which has survived heat and drought in its past has a record of plant species that can survive in a heat-stressed future. Local botanists can collect such species, propagate them and generate the scaffolding for more rapid regeneration of local ecosystems as warming occurs. These clusters of species are then propagated in **Future Gardens** that act as educational scientific experiments,

as well as nursery beds of future plant ensembles that have the capacity to regenerate heat-stressed ecosystems far more rapidly than nature can, unassisted.

Future Gardens generate **biodiversity fields**, which can self-replicate in virtuous cycles, expanding and improving a biome as they develop. We work with the laws of conservation of energy and seek to reduce entropy place by place.

Counterforce Projects

Regional scale: Living Forests (2015 to present)

California is in a crisis of fire and water. Decades of fire suppression in the western United States created forests that have far too many small diameter trees. This puts them in constant danger of mega fires, destroying biodiversity, wildlife, topsoil and water supplies and potentially devastating whole communities. The need to restructure forested areas throughout the west by selectively removing excess small-diameter trees and returning ecologically necessary fire to the ecosystem is now clear. Can we build a whole systems approach where the act of harvesting preserves the system, spurring the creation of a radically new wood-based economy and simultaneously improving wildlife habitat, water quality and public health? Bringing into being biologically sound, economically productive forests in the presently fire-ravaged 150 million acre forest ensemble in the American West.

See www.livingforests.org for more information

Where it can be seen that a tree farm is not a forest



National scale:
The Deep Wealth of Scotland
(2017 to present)

This work began at the joint request of an art institution and a science institution both in Scotland. It takes up the five great commons of Scotland, the air, the water, the forest, the topsoil and the commons of mind, wherein the deep wealth of this country can be located, evoked, and put to work both in increasing the biodiversity holdings of the country and its economic holdings simultaneously. This work is in progress and we are forming multi-disciplinary teams to address each of the five commons directly.

Exhibition panel, The Barn Arts Center, Aberdeenshire, 2018



Counterforce Projects

Continental scale:

Peninsula Europe IV (2000 to present)

The best present scientific information suggests that about 20–30% of the productive lands in Peninsula of Europe will suffer drastically reduced productivity as a consequence of global warming associated drought. With an increase in population and a decrease in productive lands we are looking at civil breakdown. We propose that mediating this crisis will require re-terraforming one million square kilometers to create water-holding landscapes, that will turn into a series of oases. Around each oasis a new form of circular farming would be implemented.

Peninsula Europe IV addresses the question of how to confront and mediate a one million square kilometer drought, moving from Portugal to Mid-Europe.

Initially supported by the EU Cultural Fund and the German Environmental Ministry as well as four museums in three countries.

Detail from the video about the testing of global warming in relationship to the upward movement of species as temperatures rise, 2001



This is a little drama entitled *The Mountain in the Greenhouse*. The theme is the disruption living systems will undergo as the perturbations of global warming reverberate through the European high grounds. It is a drama being enacted in fast time if you happen to be a glacier but slow time if you happen to be a person.

From Peninsula Europe IV

Are the conditions in place yet
That require a bold experiment
At unprecedented scale and cost
And with unpredictable outcomes

For instance, out of 2.3 million square kilometers
of farmland
20 percent probably, possibly much more
Will yield to drought

Out of 650 000 square kilometers
Of mostly monocultural forest
80 to 90 percent will yield to fire, disease, flood,
and drought
In the high grounds
With the predicted 5.5° Celsius temperature rise

Out of 340 000 square kilometers of grassland
Typically monoculture
30 percent will yield to drought

As 450 million people become 500 million
And waters rise
Forcing the upward movement of people
And as food production drops
And markets are harshly stressed
If business continues as usual
The best likely case is food rationing
The worst case in many places
Is the collapse of civil society

Better much better
That resources are diverted in the trillions of dollars
To assist the soils of the subcontinent
In becoming a vast sponge mosaic
Encompassing the high grounds
Where the rivers begin
And continuing from high grounds
To low grounds to ocean's edge

Understanding that 2.3 million square kilometers
Originally forest and grassland ecosystems
Were terraformed into farmland

Understanding that the value
Of this vast human labor
Does not account for the loss of topsoil
The loss of seed stock
The loss of forest
And ecosystems and species
Above all the loss of earth that holds waters

From the perspective
Of the laws of the conservation of energy

All of the losses noted and yet to be noted
Represent energies now
Not available in the Peninsula life-support system

Human indifference is operating in the exploitation
Of our life-support systems
Indifference to the second law of thermodynamics
which says
Energies that are transformed
From one form to another incur a net loss
From the perspective of the laws
Of the conservation of energy
The whole landmass of the European Peninsula
Has experienced through human industry
A dramatic rise in systems entropy
Given that warming will take place
Even if dramatic carbon reduction is achieved
Entropy will continue to increase
And the systems' ability to support life
Will very likely decrease

The only response available that we see
Is collaborating with life-support systems to enable
the reduction
Of entropy peninsula wide
It is the only whole-systems response that we can imagine
As a counter to the Force Majeure
How would one begin?

By making subtle changes on the terrain
That would re-terraform the majority of arable land
On the Peninsula of Europe
Into the water-retention landscape it once was
So that all waters remain upon the lands where they fall
Simultaneously recharging aquifers enhancing biota
Lowering the entropy of the topsoils thereby

What would live and grow, and might even thrive
In the dramatically changed landscapes
That a warming planet will require
In particular on a warming peninsula
With some places wetter some places drier
And temperatures rising following predictions

The question then arises
Given the loss of seed stock
And the systems shock of rapid heat rise
And the presently degenerated properties of topsoil
How will species reform ecological niches
And habitat for themselves and others
In a new landscape mosaic
Parallel to and on a similar scale to
The reenergizing of 2.3 million square kilometers
Of topsoil across the Peninsula

We suggest a second bold experiment be undertaken
The intention of which is to assist the migration of species
Presently so under stress from rapid temperature change
Changes in soil and earth and reduction in seed stock
We propose paleobotanical research be conducted
To create a research library peninsula wide
Particularly focused on the Pliocene
Approximately 120 000 years ago when climate was
very similar
To that which is predicted in the next 100 years or less
We propose a second species research library be established
That looks at species and ecosystems
That inhabit the planet in places
That presently are close to the climate predicted over
the next 100 years or less

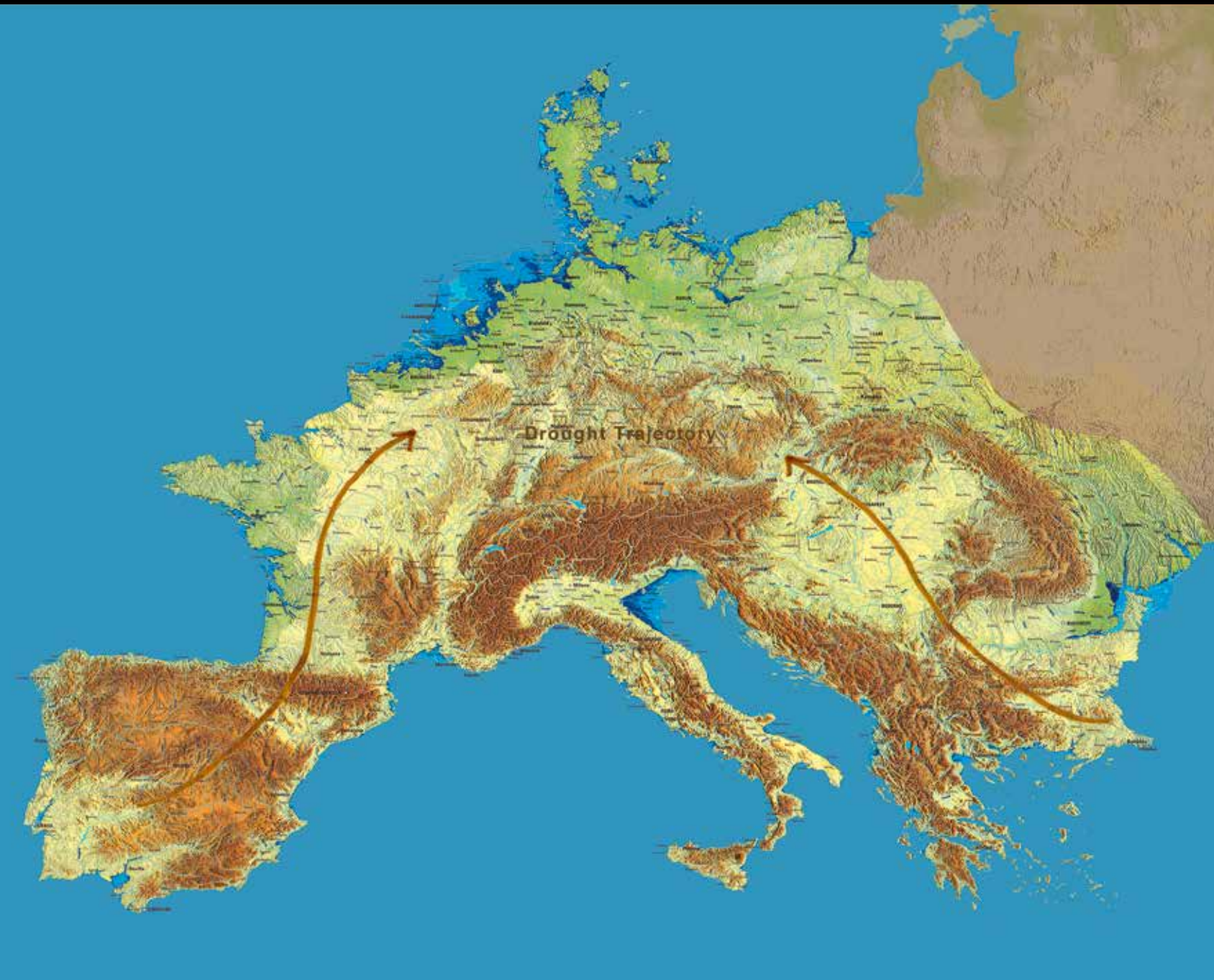
We propose a vast research effort be put in place
Charged with doing the investigation and experimentation
That would be the basis for assisting the migration
of species groupings
That would form the basis for establishing adaptive ecosystems
That if successful would self-complicate
In this new climate that seems to be our future

We see two learning curves in need of taking place
The first one is developing the methodology
For collaborating with natural-systems well-being
The second is reinventing food production systems
In which the harvest preserves the system
The system preserves the topsoil

Such would be a new beginning
An adaptation
To a very different world than we now inhabit

The greatest difficulty in this new beginning
Is not so much the research required
Or the science or the experimental design
In which concept and design can be tested in small patches
Rather it is overcoming the inertial properties
Embedded in the major cultural forces that define
Most human behavior toward our life-support systems
They are
Democracy and capitalism
Technocracy and some religions

For this level of experimentation to succeed
All must yield agency enforceable by law
To the lives that are not ourselves
Dare we say Nature or better yet, the life-web





Before water-holding
landscape design



After water-holding
landscape design



Tamera Lake

Peninsula Europe Part IV: *The Oasis*
The Tamera Group
Example of a water-holding Landscape
From 2007 to present



The Bays at San Francisco
Become a 162 000-hectare
Estuarial Lagoon
2013

I used to think the top environmental problems were biodiversity loss, ecosystem collapse and climate change.

I thought that with 30 years of good science we could address those problems.

But I was wrong.

The top environmental problems are selfishness, greed and apathy... and to deal with those we need a spiritual and cultural transformation and we scientists don't know how to do that.

Gus Speth

(U.S. Council on Environmental Quality in the Carter administration)



So say we the artists, "Travelers, let us continue the serious labor of re-enchanting the planet."

In truth, the art in all this work is the art of story telling wherein we discover that the whole built environment has its beginnings in people telling each other stories and fantasies. Presently the exploitation stories that drive so much of culture are in drastic need of revision. This is also the deep task of we artists, centered in the Force Majeure group.

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For more and comprehensive information see

www.centerforforcemajeure.org

www.theharrisonstudio.net

www.livingforests.org

and read the book by Helen Mayer Harrison and Newton Harrison:

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