

**Working Draft
April 2013**

Earth Church

Good evening. I am pleased to be here again at the Rothko Chapel to speak about the Earth and activism and spirituality. Tonight's presentation is dedicated to Herman Daly, an economist and an ethicist, who has had a great influence on me and on the way I see the Earth. So thank you, Herman. I also want to dedicate this presentation to my wife Garland whom I dearly love and without whom I would not be here tonight.

My vision of Earth Church is personal. It is about what I have found. It is about what I have observed. It is about the science that I have studied and taught. It is about life and living life on a wonderful unique place in the universe. And it is absolutely about the future.

Genesis

One of my favorite writers and thinkers is Joseph Campbell. Among other things, he has written and discussed the creation stories of various cultures. I like the concept of “story”. Consider this one.

Once upon a time, about 18 billion years ago, a brilliant explosion occurred that set in motion a series of events that led to me and you and every living thing that exists on the planet Earth – a planet that exists in this exact orbit around this exact sun in this exact galaxy – a galaxy that spins and moves ever outward in what has been termed a “pinwheel of creativity”.

This big bang gave rise to about 100 billion galaxies, and trillions of suns and planets, but the Earth is the only one that we know is home to life – the only planet known to date that is alive. It was just reported that two planets capable of supporting life have been found in the Kepler-62 system, 1200 light years from Earth. Given that a light year is about 6 million miles, these two planets are just over 7 billion miles away. And they only have a chance of supporting life

based on an analysis of their size and distance from their sun. So to date, the Earth is the only place with life as we know it.

Our story picks up about 4.5 billion years ago when the Earth emerged as a sphere with a molten core and a hardened crust of land, much of which is covered by water – water where the rawest forms of life formed 4 billion years ago, the very same place where these primitive creatures first began to choose what matter would be allowed to enter across its membranes, demonstrating at a most basic level the ability to discern – to exclude aspects of the environment from their inner selves and take in only that which was useful and nourishing.

And then about 3 billion years ago, an important event occurred. These cells developed the ability to transform light into carbon compounds by a process called photosynthesis. This carbon that was “fixed” by photosynthesis then became the organic material that nurtured other cells – the consumers - and put in motion the cycle of life – a cycle of carbon moving from the air to plants (the fixers) to

plant consumers (the respirers) and back again. This cycling of carbon from atmospheric CO₂ to fixers to respirers and back again to the atmosphere is the central concept of life on Earth. Without this carbon cycle, we human carbon consumers and respirers would not exist.

About 2 billion years ago, after millions of trials and failures, multi-celled life emerged, followed by flatworms 550 million years ago, and then by walking amphibians about 360 million years ago, and then the first mammals about 220 million years ago. Our human forebears emerged about 2.5 million years ago, leading to *homo sapiens* about 160,000 years ago, which leads to you and me tonight.

We've been a long time coming, yet it seems to me that we know little about who we are or what we are about. We share our origin with all species, and that origin is the Earth. The Earth IS genesis. It is our place, our source, our center and our essence.

Without Earth we cease to be. Planet Earth is our home. Planet Earth

is our life. It is why we are. It is who we are. We don't exist without it.

The great philosopher Rene Descartes famously pronounced "I am, therefore I am". To this I add "The Earth is, therefore I am". Me and the Earth. Tied together. Partners in life, like me and the mockingbird.

the Mockingbird

At Rice University
In Southwest Houston
Near a large live oak.

Decades ago an acorn exploded into life
Shooting green toward the universe
Much like the big bang
Hurled the universe
Into existence,
Flinging galaxies as spirals and ellipses,
Forming suns with planets,
And in one unique spot
Creating the exact conditions
Necessary to create life
On a planet called Earth.

**On this green extension to the universe
The mockingbird perches
And lets loose a hymn of celebration
That she is alive today
To sing to anyone who can hear
Her pleasure
With the long chain of events
That led to her being here at Rice
On a bright spring day,
Her aural waves directed
Back to the source,
Back to the beginning
Giving thanks for being alive,
On this wonderful Planet Earth.
Brightening my day,
Sending me on my way
With a smile.**

When the great books of the great faith traditions were written, modern science did not exist. In fact, science as we know it has been around for only about 500 years. When these books were written, we did not know the Earth circled the sun. We did not know about the origin of matter, of galaxies, of planets. We were living without that knowledge.

Today we know these things. We know that the Earth is older than 6000 years. We know that the Earth was formed by the big bang. We know that life evolved from single cells to multi cells to us. We know these things, yet we deny them in important ways. Why?

And we know even more. We know that today the fabric of the Earth is being strained by humans and human activities. We know that we humans have incredible destructive capacities. We can explode an atom. We can suck all the water from a river. We can change the atmosphere of the Earth. We know the Earth is warming. And we know that if we don't change, we will destroy that which created us – that which succors us – that very thing that appeared at this very place in space and time that led to you and me.

I am, therefore I am.

The Earth is, therefore I am.

The Earth is, therefore we are.

If the Earth is not, I am not.

If the Earth is not, we are not.

We are inextricably connected to the Earth. It is our source, our very being. So why do we not embrace the Earth as we would our mother and father for it is no less important in our lives?

We humans trace our origins to the life forms that emerged from the water – from the evolutionary soup. We are varieties of the same thing, which is life. We are inextricably connected to one another through source, through our shared genesis. We and the birds and the butterflies, brothers and sisters, working toward a common goal, to survive to sing on another day, to sit in the warmth of the sun and live life, partners in life and living.

EXODUS

The path of life and living today is different than in the past. There are more of us. And there are more footprints of our passing here on Earth, more disruptions of the landscape, more loss of those that evolved with us, more signs of our existence and passage.

Today's atmosphere is being changed by us – by humans. The carbon cycle – and the water cycle – the nitrogen and phosphorus cycles - are

all being disrupted, and these disruptions alter the patterns of life support that flow within the Earth – the rivers of elements that are the rhythm of life – the cycles that keep our system balanced – balance required by all living things.

As I speak to you today, I am talking with an audience of humans, an audience that collectively has an important role in the future of the Earth. We matter, but I have to ask:

What mental processes do we collectively have to understand and evaluate that which we do?

What values do we have to guide that which we do?

What set of accounts reflect the balances of that which we do?

What boundaries limit the reach of that which we do?

What is permissible or not in our economic theories and activities, in our views of human development?

What is it that guides us?

The great books set forth principles for living in a harsh world when there were relatively few people and relatively limited impacts

on the Earth. Life back then was often dependent on withstanding attacks from nature or other humans. Whatever perturbations we generated then were absorbed by the Earth. The major focus of these great books was to keep us humans in line relative to one another, at least to some extent.

Today we have problems beyond the scope of this guidance. We need new pathways to navigate a new landscape, a deceptive landscape where ways of the past work no more, ancient ways of thinking that the economist Herman Daly calls empty world thinking, ancient ways of thinking that today ensure loss and destruction rather than success and survival. We must move instead to what Daly calls “full world thinking” – new principles for new problems.

I created Earth Church to fill a void, to fill a need for something that I could believe in. I offer it tonight not only as something that has been good for me but as a concept that may be a template for the future – about what we as a society should consider as we push the limits of the Earth.

The Earth today is facing two combined issues that have the potential to overwhelm it and us. First, there are a lot of humans. And second, we humans are generating unprecedented impacts. Importantly, though, we humans do not generate impacts equally. We citizens of the United States are number one in consumption in the world. We generate about 20 tons of carbon dioxide per person per year compared to a global average of less than 5. We use more resources per capita than just about any civilization today. If all the citizens of the world consumed like we in the U.S. do, it has been estimated that we collectively would need four to five Earths to support the 8 billion humans currently walking on this planet. Yet we only have one Earth, one proven system for supporting life.

So it should not be surprising that here on Earth, we are facing some serious problems. Our climate is changing and we are responsible. It is time that we owned our role in climate change. We should not deny it. The evidence is overwhelming. And make no

mistake about it – climate change will cause major perturbations throughout the Earth.

I would like to take a few minutes tonight and talk about this climate change. Climate change means just that – that the climate of the Earth is and will change. It means that averages for the last several centuries are no longer predictive of the future. If you think of the traditional bell curve of statistics with the average in the middle and the extremes at the edges, climate change is causing the middle to move toward the extremes. That which once was rare will become the norm. I heard a presentation where the speaker labeled the edge of the bell curve as TBD – “there be dragons”. There are dragons in our future with climate change.

With a changing climate, the Earth will get hotter. Texas is projected to have 120 days over 100 degrees Fahrenheit by the year 2080. There will be more severe storm events and more severe droughts. Sea level will rise upwards of three feet in the next fifty

years, and if the Greenland ice sheet collapses, at least seven more feet. Temperature and drought will change food production patterns.

Our rivers will become less dependable and many will disappear. The mouth of the Rio Grande silted over in 2000. The Guadalupe and other Texas Hill Country rivers dried up during the recent drought, an event that will become more common when added with our incessant increase in surface water use. With climate change, the base flow in our rivers will shrink by as much as 30%. Our lakes will be continually drawn down, even more so than seen today in Lake Travis and Lake Buchanan northwest of Austin. Dengue fever, malaria and other diseases from the tropics will move further north as will other living things that are seeking to find new habitats, either out of necessity or out of opportunity.

The extent of the movement of humans due to climate change will be unprecedented. There likely will be an exodus – a migration – of humans that will be unparalleled in history. Over 50% of the U.S. population lives within fifty miles of the Atlantic, Pacific or the Gulf of

Mexico. If sea level rises several feet, millions in the U.S. will be dislocated. Globally, island nations will disappear. Bangladesh will see much of its land area under water. China, Vietnam and India will all be hit hard by the loss of coastal land. And people will have to find new places to live.

But that's not all. As water supplies become less dependable, food resources will be become more and more scarce. Areas at the edge of deserts will no longer be able to support crops as the deserts expand, making lands uninhabitable. Again, people will be forced to leave, to become environmental refugees, to seek food, water and shelter somewhere other than their home, some place that they do not know, strangers in a new land.

These are reasonable future scenarios based upon what science tells us. But we have to listen and we have to develop new thinking to go along with the new information that is emerging about the relationship of humans – of us – and the Earth. The coming exodus

will be both physical and metaphysical. At the least, it will be a great challenge to survive.

The Psalms of Earth Church

In addition to being honest about our current Earth condition, Earth Church is about enjoying life and other living things. Earth Church is about smiling, about joy, about finding life in all its unique and interesting forms and enjoying it. The Earth has become a spiritual base to me. It supports me in all ways.

To experience the spirituality of Earth Church, I meet and absorb the Earth. It can be in my yard at home, outside my window at work, on the campus at Rice, in Christmas Bay or the Matagorda Marsh or floating one of our rivers or bayous.

In my church, I become connected with the rhythms of Earth, with the cycles of the moon, with our journey around the sun, with the seasons. My attendance is not limited to a particular time or day or month. I simply find a natural place and allow it to become part of

me, allowing it to enter my soul and invade my spirit. And make no mistake about it. Earth Church has a spiritual core.

I have heard it said that dance liberates the spirit. Well, my spirit is liberated by experiencing the Earth and writing poems about the experience. These poems are my songs, the psalms of Earth Church. They are the celebration of that which we must protect for us and other living things.

I often enter Earth Church in my kayak. The water supports me above the soft mud that engulfs human feet that are too heavy to tread on this sacred place. I glide effortlessly, cutting through the foggy morning, hearing the cries of gulls and the croak of the heron, seeing the white shrimp leap ahead of my boat, greeting the ibis, opening my soul – my inner self - to the Earth. Letting it in.

I have come to express the concept and uniqueness of my experience with Earth Church most naturally through birds – birds that touch my soul, birds with whom I share the common knowledge of the universe, of life, of living. Birds that help me explain something

that has made my life more meaningful. You have already met the Mockingbird. Here are a couple more of my bird psalms of Earth Church.

the AVOCET

In Matagorda
On the banks of Colorado River
That no longer flows as it used to.

The fog lifted
As we paddled into the marsh
That was losing water to the moon.

The day bloomed blue and
The birds came out to greet us,
Making us feel welcome
In this church of the Earth.

The osprey fell from the sky
And rose heavy with fish.
The flock of small waders
Shimmered in the sun
Turning to and fro with delight
In their ability to fly.

The vultures and the caracara

**Hung low above the fragmites
As the mergansers scuttled before us,
White wing patches bright against
The blue-green water of the cove.**

**The avocets flew by at eye level,
The line of birds pulsating up and down,
Their upturned beaks in a line,
Rivalling the ibis and roseate for beak of the day.**

**And at the end of that glorious day,
Reclining on my kayak – floating,
Lost in the high whirling white clouds
Painting images across an aquamarine sky.**

**Kayak thoughts fly through my head –
I have been drinking from the fountain of the Earth
And am awed at how it slakes my thirst,
At the pulses that flow through my mind
And encompass me in peace and harmony,
Calmly, causally, completely,
Without forethought and without planning,
Simply flowing into and through me,
Freeing me from the bondage
That I have allowed to be imposed
On myself.**

In the waters of the Matagorda marsh

I have found a spiritual home.

the ROSEATE SPOONBILL

**I am in the church of the Earth
And the pink bishop is in residence,
Striding across the shallow flat
Head down, moving to and fro.**

**I come to Earth Church for services
That renew my soul.
The sunrise starts the service by allowing
Me to see,
A gift for which I am grateful.
I listen to the chorus of redwing blackbirds
Greeting the sun, welcoming me.**

**The pink bishops rise, painting the blue sky
With a pink ribbon of undulating life,
Speaking to my very essence
Of the nature of life
On this rare and precious planet,
Of the relationship between all living things,
Of our duty as stewards,
Of the responsibility that comes with being
One of the living.**

**The congregation gathers in celebration,
The ibis, the willet, the sandpipers**

All chirping praise to the glorious day
That I celebrate by enjoying it,
By living it to the fullest.

The benediction is laid down by the
Presence and aura of the caracara,
My special keeper,
Who comes to tell me that it is good
That I came to church today,
Asking me to return soon
And take his message back to those
With whom he does not speak.

I leave church with a smile,
Unlike many of my childhood visits
To a church of another type
And I pray to the pink ones
That I live to attend again.

the REDWING BLACKBIRD

There is a choir
In the church of the Earth,
Led by Brother Redwing
Who stands on a cattail podium
Singing glory to the sun
That brightens up the day.

Brother Redwing sings not

**Of the devil or evil
But rather a song of celebration,
Of the joy of another day
Of life on Earth.**

**Like the old Baptist hymn
Called "Dwelling in Beulah Land",
Brother Redwing is feasting
On the manna from a bountiful supply,
Manna from the wetland that provides
Food, water, shelter and cover.**

**Brother Redwing also sings of stewardship,
Of the need for balance,
Of the quest for limits,
Of the need for all living things
To adopt an ethic of life,
A way for us all to live together.**

**At the benediction, Brother Redwing
Sings of peace, of harmony, of salvation
That will be yours
If you dunk your head
In a wetland you helped preserve
And let the waters make you whole.**

The 10 Commandments of Earth Church

Earth church needs no edifice, no pomp, no ceremony. The Earth exists and when I engage with the Earth, I am in church. There are, however, some basic concepts, some principles – in the Biblical metaphor, commandments - that emerge from a relationship with the Earth, principles about care of the Earth and about how we should relate with each other.

Stated otherwise, if you decided tonight to join Earth Church, what might you stand for? So here are some suggested principles for Earth Church.

Principle 1 is respect for life and other living things. Life and other living things are part of the Earth and inherent in Earth. We all emerged from the water together. We come from a common stock. The Earth is alive with humans and other life forms. There are basic forms of understanding and decision-making made by other living things. Life is what makes Earth unique. It seems to me that we must embrace other living things if we are to understand and maintain this planet of life. Earth and life. Together. Now this does

not mean that I cannot eat other living things. That is part of the natural cycle within which we evolved. But what it does mean is that I should have a much different relationship with other living things. We should include them within our value set.

Principle 2 for Earth Church is population reduction through education and reproductive choice for women. The Earth is full of humans and more are coming every day. Population control is a tough issue that must be addressed head-on. Earth Church must embrace both the education and empowerment of women everywhere. Across the world the pattern is clear – educated women have fewer children. And education must be followed with access to contraception and choice about reproduction. We cannot afford to bring unwanted humans into the world. Humans consume disproportionately compared to other species. We take too much. Continuing growth in the global population of humans is not a good thing for the future of the Earth based upon current patterns of consumption. We simply may not be able to survive ourselves.

Principle 3 of Earth Church is that the basic needs of all people of the world should be met. I and every person in the world have the right to have their basic needs met. All of us have a fundamental right to food, water and shelter. We all need some path, some process, some hope to meet these needs, whether it be by farming or by being employed or by owning a business. If people do not have access to basic needs, chaos will result. It is both self-serving and necessary for the Earth to ensure that all persons' needs are met.

Principle 4 is the identification and realization of “enough”, of placing limits on our “wants”. It is unrealistic for me as a human living in the United States to assume that the rest of the world’s population does not aspire to consume to our standard. That seems to be the goal of much of the world – to reach the same standard of living as you and me. Yet that goal cannot be met within the limits of the Earth with existing production practices. It simply cannot. We in the West seek satisfaction through material goods, through immediate gratification of our wants, yet we seem perpetually

unsatisfied. We must restore satisfaction to the human self while using less. There is not enough Earth for all wants to be met. Seeking and discovering fulfillment must emerge. My mantra for Earth Church is – I use enough, I have enough. And for that I am grateful. I do not need to further expand, I am content with what I am.

Principle 5 of Earth Church is that human economic principles over time should be conformed to the Earth's ecologic principles. In this way, we will create a society that exhibits balance between economy and ecology. Here, it makes sense to challenge the concept of economic growth as practiced today – an idol that that we practically bow to – the false God of unmitigated growth. If nothing else, this principle is a cry for efficiency – for reduction in the material and energy content in every product that we make and consume. This is true with regard to energy and water and all forms of matter. Less will enable more within limits. The efficiency goal of Earth Church is to produce every product with less footprint – with less impact – with a long term goal of keeping that footprint to the absolute minimum.

We have to begin now and implement this in the future. It is the way of the future. It is the future. And as members of Earth Church, we should consume with this goal in mind.

Principle 6 requires that our society empower all and seek equity. Fundamental to Earth Church is that we humans each have a voice and have a right to be heard. We also have a right to know about certain things – to have access to information. We have a right to be governed by a system that empowers us to participate in the decision-making process, and we have a right to be governed by a system that seeks to minimize human impacts and protect our air, water and land. We have a fundamental right as humans to not have one sector of society exposed to greater health risks than other sectors. We have a right to life and to conditions that support life.

Principle 7 is a mandate to celebrate and learn about your place – your geographic center on the Earth. I enjoy my place and I embrace it. Earth Church is about the Earth and as a member of Earth Church, I must learn about our natural system and get out and enjoy

it. Communion with the Earth, with its rhythms and its patterns, with its beauty and its spirit, is essential to who and what I am. Without understanding the characteristics of the Earth at the place where I live, I am nothing – I am without context. I would be lost but for my place on Earth.

Principle 8 holds cooperation as the highest form of social interaction. Success is about the whole and not about the pieces. If we all don't succeed, then we all fail. Earth Church is about the Earth and all of its living community succeeding. It is larger than the individual, although the individual is a key part. I as a member of Earth Church have a duty to cooperate, to work with others to achieve these principles. In my life, I work closely with others, with a team. We succeed together. We fail together. We respect each other. Such a team is necessary on a much larger level if the Earth is to survive. Team Earth for the future.

Principle 9 is the adoption of creative conflict resolution concepts including ultimately the elimination of warfare. We can and

should do better as individuals and as societies in resolving disputes. We are not yet beyond physical and emotional violence as a solution to our disputes. We are going to disagree as humans. It will happen. Most of the Biblical 10 Commandments were about behaving in a manner such as to not kill each other or otherwise become involved in disputes. But we do and we simply have to get better at resolving these disputes. I have lived my entire life a few precarious moments away from the total destruction of all life as we know it. I have spoken against War. I have acted against War. Our concepts of dispute resolution must change.

Principle 10 of Earth Church is to pledge to try as hard as you can to be accepting of change. Change is an essential core aspect of Earth Church. Earth Church is not “business as usual”. Earth Church is about seeing the Earth and yourself differently and acting accordingly. I smile as I write about change because it is easier to write these words than to live them. But our commitment is not to change immediately but to simply be open to - to try to - change.

And now a conversation with the Black Vulture.

the BLACK VULTURE

**The High Priest of Earth Church hops atop the raccoon
And begins recycling for he must act soon.
While feasting at roadside the priest talks to me
Of things that are needed to live sustainably.**

**Thou shall not kill unless to consume;
And not burn carbon beyond your fair share;
Always leave behind a livable home,
And let equity rein between human and hare.
Let each be a partner of the natural world,
And seek to discover the least damaging way;
While saving on energy and matter and things,
And thinking of those who've not yet had their day.
Make societies equal near and far,
While waging peace rather than war.
And don't let change stand in your way
As you take this message to lands far away.**

**So sayeth the vulture from the Texas roadside
And from those ten thoughts you cannot hide.
And I smile as I see it hopping aside,
The priest has spoken and all must abide.**

The black vulture as the high priest of Earth Church is a fun image – lighthearted – one that pokes fun at stereotypes that we maintain. Vultures are often thought of as negatives – the hunchbacked harbinger of death, the circling villain. Yet the vulture performs a most valuable process, one essential to the circular nature of Earth systems, the return of life to inert status so it can come back again. Nature’s recycler. We need to find the fun in life, in the challenges, in the hard work that lies ahead.

Change

I would like to spend a bit more time thinking aloud with you about change – Principle 10 of Earth Church. Now, this change is not to revert back to some cave, but to rather to move forward, to live a modern life in a modern world. It is about adopting and embracing the future rather than maintaining the past. It is about full-world thinking, but to get there, we have to change from empty world thinking.

Among the many key philosophical statements Aldo Leopold voiced is one that has literally bounced around my brain since I read *A Sand County Almanac* and that is the following – that the adoption of an Earth-based ethic, what he termed a land ethic, is an ecological necessity and an evolutionary possibility.

The realization of this evolutionary possibility with our brains and from within our souls – within our principles of life and living - is a key concept to the future of the Earth. Physical evolution takes hundreds if not thousands of years and we do not have that long. We must evolve mentally, which is, supposedly, the capacity that separates humans from other species. To be a part of the realization of an evolutionary possibility is a profound opportunity that is open to our generation and the next few that follow us.

Among other things, we need to open-minded about change and where we might find support for change. We need to challenge ourselves as well as those that may not agree with the goals and

principles of Earth Church. We need to find change agents and incorporate them into my thinking.

One of my favorite anecdotes about change came from Jake Hershey, the late husband of Terry Hershey, whom I considered to be my mentor about business things. One day he was laughing about change, about how it was ever present. He asked me if I thought that we should not have accepted cars even though they put the buggy manufacturers out of business. I have to admit I never thought of that fact about cars – that they put buggies out of business. Not many horse and buggies any more.

That type of change we seem to accept as business as usual. But what about change in our view of the world, in our understanding of human capacity to generate impacts, in our belief structure about humans and human obligations to each other and the Earth? That is also change, but of a different type. But what if business principles were to become aligned with the principles of Earth Church? That change could occur must more quickly.

In my first paper about environmental law in law school, I proposed to make the oceans into a nation so that the ocean would have standing in a legal sense to sue for pollution damages. My professor, a former international lawyer for a major oil company, did not like the type of change that I was proposing and gave me the lowest grade in the class. Later, I won a national contest with the same paper. So sometimes, how and to whom you present an idea makes a difference.

So, what if we were to approach some of these philosophical and spiritual issues from a business perspective? If business can make money on a concept, then that type of change will occur extremely rapidly. And in fact, that is already beginning to occur.

Principle 5 – economic and environmental efficiency – is beginning to happen throughout the business community on a modest scale. It is being driven by consumers – consumers that want to know what the “true cost” of products are, consumers that are seeking to buy the cheapest good with the least environmental and

social footprint. Among other things, those of us concerned about the Earth are also consumers. We should think of that as a tool for implementation. Our purchasing should support companies reducing their footprint.

Zero footprint is a key business concept of the future, and it is happening now. Go to the web site of Google, Nike or Pepsico and see what they are writing about footprinting. Go to Coca Cola's web site and look at their analysis of water. They have blue, green and grey water to demonstrate the different ways they are thinking about water. And many other companies are trying to become carbon neutral.

So this is good for reducing the footprint. But what about the Earth itself? What business solution is there that might protect and enhance the Earth. And the answer here is that we need to value nature correctly in the economic system. If the Earth is our life support system, if all human life is dependent upon the life of the planet itself, what dollar value do we place on the services – the

ecological services - that the Earth performs for us? What is it worth to us that trees and plants take carbon out of the atmosphere and pump it into our soil, removing it for decades if not centuries. What value do we place on the ecological service provided by recharge areas for aquifers that allow water to move back into the ground to be used in the future. What value do we place on ecological services provided by the rivers that bring freshwater into our bays and estuaries, providing the sweet water and nutrients that are necessary to nurture the shrimp, crabs, oysters and finfish that we eat and that provide recreation to us all.

Many of my friends in the environmental community resist placing a value on nature. However, I think we must be practical here. From what I have seen over forty years of involvement in environmental law and planning, ethics alone will not penetrate our society. I have a hope that an ethical structure will emerge over time in support of the Earth, but we need to change fast and placing a dollar value on nature and allowing landowners to realize income

from protecting nature will be the fastest immediate way to protect and enhance many of local ecosystems.

At SSPEED Center at Rice University, we are working on the creation of an exchange similar to the stock exchange except this one is for ecological services, these services provided by the Earth. This exchange is conceived as a web-based trading platform where ecological services of various types can be bought and sold. In this manner, farmers and ranchers can realize income from protecting and enhancing the natural environment by becoming carbon farmers to capture carbon dioxide and remove it from the atmosphere. Here, businesses can purchase carbon dioxide offsets provided by carbon farmers, bird habitat provided by coastal woodlots planted by entrepreneurs seeking income to support their interest in keeping their farms and ranches in their family's hands.

At Rice, we are investigating the existence and extent of the market for these various services, including carbon offsets, various types of habitat protection, flood absorption, wetland mitigation and

endangered species offsets. Here, the market may be even greater than the corporate world. Various philanthropic organizations interested in protecting coastal resources, for example, could purchase the services but not the land for preservation purpose, thus keeping the property in private hands. Or can you imagine giving your significant other a birthday gift of restored native prairie bird habitat, or perhaps an offset in their carbon footprint for the next year by buying the rights to the carbon stored in several acres of coastal marshland. Now, I know some of you may be thinking that such a present will only lead to divorce or at the least acrimony, but in a decade, I predict we all will be thinking in these terms.

Or perhaps you could think of this exchange like the collection plate of Earth Church. Every so often, you could make a payment to the Church, sort of like tithing for the Earth. And the terms and conditions of this arrangement may provide for excellent management and sufficient cash flow to maintain these natural systems.

Or take Texas water law. It is an archaic system that must change, yet the water dinosaurs of Texas are holding on and resisting this change with all that they have. I recently went to court and obtained a ruling from federal Judge Janis Jack of Corpus Christi that the State of Texas had killed 23 whooping cranes with their outdated water management practices which have to change if we are to have living bays in the future. I also discovered that Texas does not charge anything for its surface water. Over a century ago, we started off giving this water away on a first come, first-served basis and we keep giving it away long after we have already given too much away. The natural system – the flowing river, the flourishing bay – has no right to water under the Texas system. We will simply dry up the rivers and kill the bays, even though that will end up costing us millions of dollars in coastal productivity and great aesthetic loss – loss to the point that I am writing a book titled *Texas's Vanishing Rivers*.

That is our system. However, if water users were required to pay for the damage that occurred to Galveston, Matagorda, San

Antonio and Nueces Bays, we would see desalination widely used throughout Texas. We would see solar and wind energy removing the salt from brackish groundwater that is plentiful throughout the State. Technology would emerge if there were a dollar incentive.

Instead, with no value given to nature, with no standing for the Earth in Texas's economic system, we simply kill our bays. Perhaps we should add the new commandment that "thou shall not kill a bay".

And then take climate change. It is anticipated that the dollar damage from climate change will be unbelievable. But as people become more aware that climate change is costing them money, they will become more willing to change.

Here, the most interesting business sector is the insurance industry. They quit insuring climate-related tragedies several decades ago when they pulled out of the flood insurance business. They have, for the most part, pulled out of the coastal wind insurance business. They could not predict their risk, so they pulled out, leaving the government to subsidize the process. And guess what – the federal

flood insurance program is nearing bankruptcy as is the Texas wind insurance pool.

If nothing else, business can help lead us into certain types of change in the near future that we might not find the strength to pursue otherwise. In this way, business can cut a path but we have to widen that path by individual action and personal commitment.

There is a role for business in helping us through change, but we also have to step up with our personal convictions and with our willingness to speak up.

Most of us were not raised to be accepting of change. I lived through the sixties, and at times it scared the hell out of me. It was exciting, even exhilarating, but it was also scary. Everything was up for grabs – morals, social principles, civil rights, Vietnam, the environment – all in play. We collectively moved past denial about our society and it was eye-opening. And then we got past the crisis of confidence and we all settled back in - all too quickly back to norm, away from change, away from the mental discomfort that came with

the new and unknown. After that, complacency settled in and many never again allowed themselves to budge from the comfort zone.

The coming years will be much more challenging than the sixties. For those that are unprepared, it will be scary. We will have physical dislocations. Populations will need to move from the coastlines. People will be uprooted. Migrations of humans and other living things will occur around the world. There will be food and water shortages. There will be energy challenges. And there will be a massive temptation to simply kill each other as a solution. We can wipe each other and other living things out or we can change. And if we want to live and want other living things to live, we better learn how to change.

Earth church stands for all of us learning to do the things of daily life differently. It stands for thinking about life and other living things differently. It stands for using less and wanting less and becoming much more in tune with nature and natural cycles. But to get there, we must embrace, accept, adopt and become excellent at change,

because our ability to change – to evolve mentally – will define success in the future and will define the success of Earth Church which is our collective, social, Earth-based success.

I like thinking that I am a participant in the realization of an ecological necessity and an evolutionary possibility. It makes me feel good about myself and about the future. I am not always great at it. But I am trying to think and act differently.

That is our challenge – to become agents of change in whatever way each of us can be with every ounce of energy that we can put into it. It is the challenge of the 21st Century. It is our legacy.

the Oystercatcher

**I walk to the banks of Christmas Bay
And launch my kayak for a long slow ride
To the future,
To a place where life and all livings things
Are special, are revered, are sanctified,
A place where we live by principles
That give all life a chance to survive,
A chance to realize the potential
That emerged from the Big Bang
To bring forth you and me**

**And birds and bunnies
And all forms of life on this living planet.**

**I come back to the bay, to the moment
And realize I have been talking
Aloud to an oyster reef
About this future,
About this potential of my species.
But I have not been unheard.
I see that an oystercatcher has been listening
From his place amidst the living shells.**

**He lifts his neon orange beak
As a sign of recognition
And gives me a knowing nod
Of his chocolate brown head,
And then winks his golden eye
And whispers to me “yeah buddy”.**

Earth church is the future. Thanks for listening.