OUR ECORESTORATION TECHNOLOGY

Our mission is to replenish and restore damaged habitats in the ocean and on land. By restoring plankton ecosystems in the oceans and growing newforestation projects worldwide, we are able to help mitigate the impacts modern society has on our planet.

We engage in active ecorestoration because mere conservation and reduction of our footprint upon the planet will clearly not be sufficient to pass our success as planetary stewards to our children. The harm we have caused this small blue planet must be healed, and it will take a determined and intelligent effort to accomplish this.

Our work is proceeding in a careful scientifically sound manner starting with a small series of pilot scale projects to test various hypotheses, technologies, methodologies, and to carefully observe and quantitatively measure any and all effects. In our ocean projects we have long joined with the ocean science community in supporting serious science based research and development. As such our proposed projects will involve 30-100 tonnes of natural iron minerals dispersed in a carefully measured and monitored fashion such that the target concentration of iron in the treated ocean waters reaches 100 parts per trillion. Since background levels of iron in high sea areas is normally 3 parts per trillion this is a very small change. Natural dust storms produce far larger effects depositing minerals measured at millions of times greater quantities than our proposed work. Iron is one of the safest least toxic substances known, the lethal concentration for fish and other animal life is measured in parts per thousand - that's a billion times higher than the levels we seek to achieve. Indeed the concentration of iron in a mothers milk is is measured in parts per million, a million times our target levels.

Developing and Delivering Technology for Ecorestoration

Developing technology and know how that works to restore ecosystems is both a complicated and satisfying task. Know how and technology developed by members of the company have been in use restoring damaged ecosystems for over 30 years and are now in use in North and South America, Europe, and Asia.

Some of this technology is as simple as transferring common sense notions of horticulture into forestry for the purpose of reforestation. Others become more complicated with the addition of natural species mix selection planted in clusters instead of rows will accelerate seral staging of recovering ecosystems.

We are constantly working to develop and deliver new ideas that will result in more rapid and resilient restoration of the ecosystems we work within. One such idea we developed is using sub-micron natural iron ore dust in ocean micro-nutrient replenishment. Since the ocean ecology has evolved to be able to use the natural hematite form of iron ore, the red color found is common dirt or dust in the wind, we reasoned that the critical ecological issue was governed by the size of the hematite dust particle. Mother Nature has her limits to grinding mineral particles and only a tiny fraction of such particles lofted as dust in the wind are smaller than a few microns. The sinking rate of particles of dust in the oceans is controlled by its size and how fast a particle sinks out of the photic zone of the ocean defines its' ability to deliver iron to photosynthesis. Simply choosing to use high grade hematite ore at sub-micron particle size converts the sink rate from hours to weeks enormously enhancing the time during which the hematite contributes iron to photosynthesis.

A remarkable fact about iron in the ocean whether it derives from dust in the wind, upwellings, or our intentional replenishment is that for each tonne of available iron photosynthesis is stimulated such that 100,000 tonnes or more of CO_2 is fixed as plankton biomass. In some reports Fe:CO_2 fixation has reached 1:400,000. If some fraction of this fixed biomass sinks to depths beyond say 500 meters it has entered a zone from which recycling back to the surface is delayed by hundreds to thousands of years.

Other technology we have and are developing for ocean micro-nutrients engages engineering characteristics and specifications for equipment and materials that enhance handling, distribution, and measurement of the effects of iron micro-nutrient replenishment. Additional technology is targeted to the task of precise measurement for the purpose of verification and certification. Still more methodlolgy is targeted toward producing a comprehensive ecological picture of the effect of the restored ecosystems. And last but not least, environmental metrics must be married to economic metrics if such ecorestoration projects can become self funding, via the actions the world is taking to accomodate the requirements of climate change legislation.

With extensive experience in developing ecosystem measurement and mapping methods, and with technologies counting back to early computer driven ecosystem models (in the age of data entry via punch cards), the Planktos Science team is well qualified for tasks at hand.

Why Ecorestoration Is Needed Now

The greatest peril facing the planet today is the overload of CO_2 already spewed into our atmosphere over the course of our 150 year love affair with fossil fuel and with each other. Our population has risen from a few hundred million to over 6 billion in that time. Indeed this "greenhouse gas" CO_2 is slowly causing the climate to change, as in global warming but the greater, rapid, and immediately perilous impact of CO_2, is in the acidification of the oceans and devastation of ocean plankton, the ocean forest. By all accounts ocean acidification from this CO_2 is proceeding at a rate that will leave the oceans berift of habitat for life forms beyond that of the procaryotes in a few decades. This loss of ocean plant life has been proceeding apace with an effect far greater than eradication of our rainforests. Sadly our ocean forests, all but invisible to man, have not been comprehensively studied until very recently. Since we launched Earth observing satellites in the 1970's we have seen the loss 17% of ocean plant life in the North Atlantic, 26% in the North Pacific, and horrifyingly 50% in the

LEARNING

Listen to Russ George in an interview on BBC 4 HOT STUFF broadcast June 2008

podcast

Listen to a discussion about the work of Planktos on the popular New York City Brian Lehrer Show Jan 2003

Listen to the broadcast
Real Audio

ADDITIONAL LINKS

On The Shoulders of Giants

Search Patents

Treehugger Report

OTHER INFORMATION

Intellectual Property ?

Mike Markel Patent Claims

A patent issued but as yet reduced to practice or defended against the obvious lack of originality.

sub-tropical tropical oceans.

This dust in the wind arrives only episodically though in some regions it can be both predictable and substantial. This gigantic dust storm blows off the Sahara enshrouding the Canary Islands. In a few days it left a gritty layer on car windshields in Florida. Each year hundreds of millions of tonnes of this mineral rich dust blows onto the Atlantic Ocean.

Check here from time to time for more information.