

UNIVERSITY OF CALIFORNIA
SANTA CRUZ

VERDE OSCURO

Envisioning the ancient Forest to dream of a Greener Digital Arts Research Center Building
(The GDARC)

A thesis paper submitted in partial satisfaction of the requirements for the degree of
Masters of Fine Arts
in
Digital Arts and New Media

by
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Abstract-Statement

Verde Oscuro is a video mapping projection masking the Digital Arts Research Center (DARC) facade at UCSC in combination with an installation of live native California plants. The spectators travel through past, present, and future envisioning the ecological history of the DARC building. The audience perceives how a place that was initially a redwood forest some hundreds and thousands of years ago is now a building that could be a green building coexisting in balance with nature in the near future. My environmental design philosophy proposes the use of native California plants to promote the integration of nature with architecture. This visualization is the first step toward opening minds and creating awareness of the ground where the DARC is standing on today.

DEDICATION

To the Mother Planet eARTh...

Acknowledgment

This project would not have been possible without the support of many people. I want to express my gratitude first to my advisors, Prof. Helen Harrison and Newton Harrison who were abundantly helpful and offered invaluable assistance, support and guidance. Deepest gratitude are also due to the members of the supervisory committee, Prof. Soraya Murray and Erika Zavaleta without whose knowledge and assistance this study would not have been successful. Special thanks also to Felicia Rice for her emotional and invaluable support since I arrived to the United States. I also would like to convey thanks to the greenhouses at UCSC, especially to the director Jim Velzey and his staff; Gene Felice, Drew Detweiler, Tina Hand, Eve Warnock, and Pelham for sharing invaluable technical advice and offering assistance during the experimental projection over the DARC. Not forgetting the beautiful people I met in Digital Arts and New Media Program (DANM), now good friends. I also want to give my thanks to the Porter College Fellowship and Graduate Students Association for providing the financial support means and facilities. I wish to express my love and gratitude to my beloved families and friends in Colombia; for their understanding and endless love, through the duration of my studies. And of course to Mother Earth who is my inspiration.

Verde Oscuro is a video mapping projection complemented by an installation of live native California plants. It explores a way to communicate an ecological history of the soil on which the new Digital Arts Research Center Building (DARC) at the University of Santa Cruz California (UCSC) stands on today and the importance of creating balance between nature and a new technological building. *Verde Oscuro* is also a play on words between different languages: English-Spanish, Science- Arts and Nature-Buildings, a wordplay that means “dark green, green dark or greening the DARC. Finally, *Verde Oscuro* is an invitation for the future initials at DARC to become G+DARC, the Green Digital Arts Research Center (GDARC).

The video mapping projection masking the DARC is a metaphor for the history of the space the building occupies today. The piece lasts 13 minutes using video and music that evoke the ecological history of DARC’s space in three eras: the past, the present and the future. While the live plants installation indoors and outdoors intends to create an environment to perceive and feel the inherent goodness of plants, and also to disperse native California plants in order to raise environmental community awareness for the DARC.

The projection first invites viewers to look back into the past: a Redwood forest and its animals, which lived in the same space for hundreds and thousands of years ago. The second part embodies a current live machine of numbers, designs, and digital art installations. The future ends the projection as a call to mother nature, an invitation to create balance in the DARC building using time lapses of seeds germination and flowers opening, following with plant pollinators and visitors like bees, butterflies and birds. The future is also an allegory for an upcoming green building, the Green DARC... or el *Verde Oscuro*.

I used the considerable potential of new Video Projection Mapping because it is able to create magical visions covering places and buildings using their surface architecture to reach a mass audience. The result is a dynamic projection installation that transcends ordinary video projection. I am sure that the advantages of this technological tool is the first step for opening minds and inviting thoughts and dreams for a new future – in this case, for a technologically advanced building that exists in balance with nature and uses plants based on a design philosophy that promotes the integration of nature with outdoor and indoor architecture. This proposal is also meant to invite students, researchers and professors from a variety of disciplines across campus to become involved in this process over the coming years.

The live plant installation, displayed indoors on the first and second floor, and outdoors in front of the DARC, invites the public to take a plant and transplant it as a way to disperse native species for

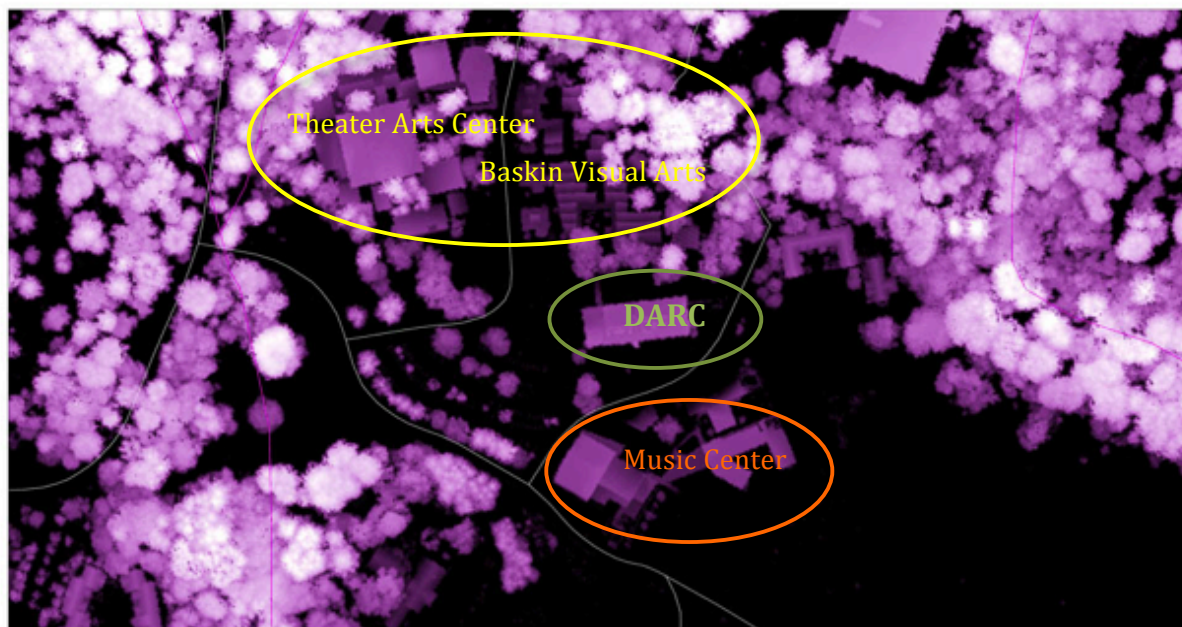
beauty, contemplation and all the goodness that plants bring to our lives, like providing food and shelter for birds, butterflies, bees and generating an atmosphere where the human body feels happiness, relaxation and creativity since nature promotes positive emotions, psychological resilience, and wellbeing. In collaboration with the Greenhouse Nursery staff and volunteers at UCSC we installed around 500 plants. The six native California plant species used were *Armeria maritima* “sea thrift”, *Artemisia pycnocephala* “Beach Sagewort”, *Dudleya caespitosa* “Dudleya”, *Eschscholzia californica* “California poppy”, *Fragaria chiloensis* “Beach Strawberry”, and *Lupinus nanus* “Sky Lupine”.

Verde Oscuro seeks to channel a message: in the same space that was once occupied by redwood forest and now houses a building, we can create a green building surrounded by native plants. I believe that envisioning the history of DARC’s space as a redwood forest some hundreds and thousands of years ago, and being aware of the present structure enables us to imagine a future building living in harmony with nature: a wonderful space where the Digital Arts and New Media students, professors and visitors can have a peaceful place to be creative and joyful.

As a final point, this paper explains how making this piece in the context of my M.F.A affected me and facilitated the integration of the arts in my work as a scientist. Thanks to the theoretical and experimental classes, my experience as teaching assistant and mainly my physical experience in a country and place I have never been before, Verde Oscuro is the result of that alchemical conjugation and transformation to express a sense and an idea living in my body here and now.

This paper starts with a description of the DARC and follows with an explanation of climate change, global warming, the psychology of solastalgia, the ecological crises and artists who I admire and are inspiration for my work now and for the next future. To finish, I explain how the artistic piece took form, the physical reaction of the audience and what changes could be made to have a stronger piece in the future.

Part one: The Digital Arts Research Center (DARC)



GIS Lidar Image 2008, archives GIS Labs, UCSC.

The Digital Arts Research Center (DARC) at University of California Santa Cruz (UCSC) is a three year-old Building inaugurated on 29 April 2010 after 21 months of construction work. The 24,000 square foot building is located between the Theater Arts Center and Baskin Visual Arts Center buildings above and the Music Center below. Today, it is the location of the Digital Arts and New Media M.F.A. program, as well as studios for digital photography, printing, music research labs, drawing, photography classes, and faculty studios (Rappaport).

The DARC was designed by Bohlin Cywinski Jackson and constructed by DPR Construction (DPR). Bohlin Cywinski Jackson is a company with 46 years of experience in many different projects including laboratories, libraries, academic, technological and sustainable buildings amongst others. The architecture planning design technology firm has received more than 520 regional, national and international design awards (Bohlin Cywinski Jackson).

According to DPR construction “The DARC’s design consists of a modular plan and exposed systems allowing for easy modifications as the mix of departments. The structural steel building was built from the ground up and nestled into the hillside. To withstand seismic activity the constructors used micropiles and utilized Buckling Reinforced Brace Frames” (DPR). The designers and

constructors said, “Some sustainable designs are implemented like deep sun shading and high performance glazing, water-reduction strategies in both landscape and building, and high-albedo roofing. The interior of the building is full of exposed concrete, ductwork and piping. Additionally, the project team took great care to protect all trees on campus as well as design and implement a comprehensive Storm Water Pollution Prevention Plan (SWPPP)”. (Bohlin Cywinski Jackson and DPR).



Digital Arts Research Center (DARC). Photo credit: Shelby Heinzer 2013

Regarding the grounds where the building stands today, “some *sinkholes* were remediated” (DPR). According to Stanley & Weber “*Sinkholes* are very common on campus”, they are also known as a “sink, swallow hole, shakehole, swallet or doline, and are a natural depression or hollows in the Earth's surface caused by karst processes—for example, the chemical dissolution of carbonate rocks or suffusion processes in sandstone” (Thomas). Stanley & Weber describe that “common sinkholes on campus are located near Cowell Health Center, Baskin Engineering building, Family Student Housing, the Farm, and Thiman laboratories amongst others. They also explain that some

of them are shaped like a line of large bowls, and some geologists believe that this line of sinkholes formed along a buried east-west trending fault zone " (Stanley & Weber 71- 72).

In spite of the whole attractive architectural designs and descriptions, my physical experience inside and outside of the building is that the DARC as a research center of new technologies is a sterile space devoid of plants, and is a representation of our industrial designs where natural systems were considered separate from the places we inhabit.

Notwithstanding the construction and design, firms took into consideration the old oaks and redwoods standing at the back and front of the building (DPR). There is no comfortable space where students, visitors, professors and staff can hang out, rest, have lunch, or meditate on ideas and work on project outdoors. There are a few spaces where community members can connect with nature and with each other. However, until now the space outdoors does not invite people to just sit and breathe.

Inside the building there aren't any indoor plants, not even for ornamental purposes. That's curious; especially after NASA's clear air study initiated 24 years ago, which has been researching ways to clean air in space stations since 1989 using plants. According to them, there is a phenomenon called "sick building syndrome" which is a consequence of modern building designs and materials used to maximize energy efficiency since the 70's. The modern materials emit hundreds of volatile organic chemicals (VOCs) such as formaldehyde, xylene and ammonia, amongst others. Consequently indoor air is polluted by chemicals coming from sources such as paints, adhesives, carpeting, upholstery, furniture, paneling, plastic, vinyl, copying machines, computers, cleaning agents, and hundreds of other products found inside offices, hospitals, homes, and other buildings. The alarming fact is that they can continue at trace level for years and generate health problems like allergies, asthma, and headaches. The research concludes that some plants absorb volatile gasses from the air, transforming them into oxygen, clean air and generate a clean environment for healthy people (Wolverton et. al, 1; Wolverton & Wolverton, 11; Kwang et. al, Meattle).

Furthermore, I have observed and analyzed the DARC building and identified additional details of the design that could be developed. For the purpose of this paper I am making the following statements:

1. The third floor with its astonishing view is not a place to be more than 20 minutes, in spite of the amazing view of Monterrey Bay. The hall and tables are not comfortable enough to hang out or work.
2. The imaginary Monterrey view's elevator totally lost thanks to the metal wall that separate us from the remarkably scenery.
3. The indoor temperature is so weird. Some rooms on the third floor are cold while the first floor is warmer than expected. Why does the temperature defy the rules of physics?
4. The Grad Lab ventilation. Where is the ventilation? Well, the ventilation is coming from a fan that we sometimes need to turn on because someone is using strong chemicals for their pieces or because the laser cutter was burned.
5. The main entrance pavement is super hot especially on warm days. I wonder is that helping to warm the planet just a little bit more?
6. To go out in a hot day especially afternoon you will need to use a sunscreen in your eyes due the strong sun's reflection on the main entrance pavement. Check it out.

Part two: *The Climate Change, Global Warming and Santa Cruz mountains past vegetation*

The Earth is 4.54 billion years old; she has been evolving since the beginning of time and many changes on her surface and oceans have occurred since then. Her surfaces have hosted different climates, landscapes, species of plants and animals and other life forms. Between all of these species we are one of the most successful species with a history of over 200.000 years, but our last civilization has emerged from industrialization to be almost completely separated from the natural systems of the planet.

One of the main transformations that Earth has experienced is climate change, that is a consequence of changes in temperature and humidity at local and global scales. These cycles have been determined for the last million of years measuring changes in CO₂. Projects like EPICA, and VOSTOC amongst others have focused efforts drilling ice-cores in Greenland and Antartica to understand the global climate history. Thanks to these big projects we know that every 100.000 years there is a big change in temperature. Other cycles have been also determined each 40.000 and 20.000 years. The last interglacial happened 120.000 years ago and is recognized as the Eeemian Period. For the last 10.000 years we are experiencing the current interglacial period known as Holocene (West et. al, 14; NOAA).

For California, one of the most topographically, climatically and ecologically heterogeneous state in the United States, many proxy records such as pollen and microfossils have been studied to understand its history. These proxies suggest that diversity of plant species over the past 20,000 years appears to have been about the same, but their assemblages changed because the plant associations disassembled and reassembled with varying dominance patterns and composition in response to climate variation (West et. al, 13).

For Santa Cruz and Monterrey area there are not so many studies of pollen records. One of those was made in Pinto Lake located in Watsonville lakes that shows between 1770 and 1850 Mexican and Euro-American immigrants increased the exotic plants introduction **whilst the redwood deforestation happened between** 1844 and 1860 (Plater et. al 70). The same is explained in the Natural History of the UC Santa Cruz campus book. Haff in the chapter one made a human trip for the last 12,000 years since the first humans to the arrival of colonizers and the big transformation that happened those days in this lands. It is a journey that helps to understand how Santa Cruz landscapes have been transformed with the arrive of Christian- Catholic missionaries, Mexican independence, timber industry, gold industry, **logging redwood industry**, leather and gunpowder industry, lime industry, cattle grasslands until the times when the land was declared as campus of the University of California in 1957. Today Santa Cruz Campus Mountains has having “redwood forest, mixed-evergreen forest, ponderosa pine, chaparral, and grassland.” These habitats support a diverse selection of species from small to large mammals, birds, amphibians, and reptiles (Haff, 2008, CCC 1987). Some other references that the DARC area was a redwood forest are the remaining Redwoods next to the DARC. For example, the small forest down the parking lot heading to Oaks College, the Reedwoods in the path to Mc Henry Library, next to the Art Center, and heading to Theater Center. Practically, Reedwoods and some Oaks surround the DARC neighborhood.

Global Warming

As opposed to changes in climate that may have resulted as part of Earth's natural processes, global warming is the result of destroying natural landscapes, nature's forests and releasing ancient stores of carbon. These alterations we have been making is causing changes in temperature, sea ice extent and carbon dioxide concentrations that can be quickly visualized in the climate time machine (NASA 2012). The oil extraction, hydroelectric construction, mono-agriculture and modern cities or jungle's cement, can be seen as contributing factors, and a means towards our modern mutant creation. The global warming is not only a consequence of changes in the Earth's long range planetary motions, but also a result of the land use transformations that we have been strongly accelerating in just a hundred years post industrialization. As modern humans, our behaviors and

habits have contributed to global warming through the carbon footprints, and this process is alerting us in ways that will make us change our habits to return to a balance with the Earth and to remember our origins as a species. I believe that our civilization is crossing the line between the end of one era and the beginning of a new one. We now have the knowledge and the need to change, as well we are developing faster the technologies to mend this broken balance between the Earth and us. The last years some solutions for global warming and ecological crises have been proposed in different science and art communities (Dauncey 2009; Wilson 1984; Hansen 2009; Inhabitat 2012; Greenmuseum 2010, between others).

Part three: Solastalgia and the age of Ecological crises

Solastalgia is a recent concept developed by the philosopher Glenn Albrecht and first introduced at the Ecohealth Conference in Montreal in May 2003 to give greater meaning and clarity to environmentally induced distress. “As opposed to nostalgia, the melancholy or homesickness experienced by individuals when separated from a loved home, solastalgia is the distress that is produced by environmental change impacting people while they are directly connected to their home environment”(Albrecht et. al 95).

Albrecht explains “Solastalgia as a combination of the Latin word solascium: comfort and the Greek word algia: pain. Solastalgia are somaterratic illnesses (soma: body, terratic: earth-related) that threaten physical wellbeing and are caused mainly by living in ecosystems that have been destroyed, transformed, and contaminated by pollutants and toxins generated by the ecosystem’s overexploitation” (Albrecht 95). I mean original ecosystems or wilderness or wild land or natural environment on Earth where life’s diversity once existed with plants, animals, water, mountains, and landscapes. These have been altered by human machinery, exploited and changed on huge scales through mining, oil extraction, hydroelectric construction, mono-agriculture, modern cities etc. It is in my own words our modern and mutant creation.

Donehower, who writes about migration and cultural loss and identity, explains: “solastalgia captures the interrelationship between environmental degradation and the disruption of families and communities. The resulting symptoms of this human distress of dislocation and habitat destruction is –depression, alcohol and drug abuse, high rates of suicide, diabetes, and heart disease; and the breakdown of family and community culture- coupled with ecological distress are embraced in the notion of solastalgia” (2).

In the same way, "*psychoterratic illness* is defined as Earth-related mental illness where people's mental wellbeing (psyche) is threatened by the severing of *healthy* links between themselves and their home/territory" (Albrecht 95). Preliminary research by Albrecht on mining and drought has produced promising new insights into *psychoterratic illness*. There are many more environmental contexts where chronic environmental stressors negatively affect human health and wellbeing. Likewise, *psychoterratic illness* has been also named by many other psychologists working on this subject after Albrecht as "*Nature Deficit Disorder*, *Ecoanxiety* and *Ecoparalysis*. For this reason this age is recognized as ***the age of ecological crises*** (Smith).

Climate change for one, might, unfortunately, be a globally significant source of psychoterratic distress expressed as nostalgia and solastalgia" (Albercht 97). The *age of ecological crises* is the current climate change or global warming, that is not only a consequence of changes in the sun activity and earth cycles at galaxy scales, it is also a consequence of the transformation of land use that we have been accelerating for the last 100 years after industrialization and overpopulation. Modern humans, our behaviors and habits have contributed hugely to global warming. Global warming then is only alerting us to the fact that we have to change our habits to re-establish the balance with the earth and to remember our origins.

In fact, there is a recent report by the American Psychological Association (APA) titled "Psychology and Global Climate Change: Addressing a Multi-faceted Phenomenon and Set of Challenges". The aim of this report is to examine the role of psychology in understanding and addressing global climate change, including efforts to adapt to and mitigate climate change. In this paper they describe the contributions of psychological research to an understanding of psychological dimensions of global climate change, provide research recommendations, and propose policies for APA to assist psychologists' engagement with this issue (Swim et al., 6). For me this means that the psychological community is now aware of the consequences of global warming for the human psyche and of the vital role of the environment for a healthy life.

"Ecopsychology" appeared in the same way and is defined by John Davis as the story of "the home of the soul". It is concerned with healing the relationship between the human soul and the "soul of the world" (Anima Mundi). It acts as a bridge between the fields of ecology and psychology to address the psychological and spiritual roots of the ecological and human crisis that we are experiencing. During the past approximately sixty years, the focus of psychiatry's attention has gradually become enlarged, from an early preoccupation with intrapsychic [interior] processes . . . to include interpersonal and broad sociological-anthropological factors. It would seem then that a natural next phase would consist in our broadening our focus still further, to include man's

relationship with his nonhuman environment.” Four decades later, this next phase in the broadening of psychologies’ focus—call it “ecopsychology”—is finally beginning to take shape (Davis).

So is solastalgia an old and big trauma?

In our society everybody has at least one trauma. “The notion of trauma has confronted us not only with a simple pathology, but also with a fundamental enigma concerning the psyche’s relation to reality. In its general definition, trauma is described as the response to an unexpected or overwhelming violent event or events that are not fully grasped as they occur, but return later in repeated flashbacks, nightmares and other repetitive phenomena” (Caruth 89).

I believe that it accomplishes this through physiological route in our bodies, as a result of experiences that we have had in our life or perhaps patterns transmitted by our ancestors like a genealogical tree. Then, a physiological route is created like a pattern in the nervous system and maybe stored as DNA information and thus transmitted from generation to generation. This means that every human being has the whole human history in their cells; one collective and common history, and one personal. In this way, if DNA is the best archive or database that exists since the beginning of time, can you imagine all the collective traumas we have as humanity after all this war, repression, and loss of the wild environment?. Trauma generates pain, pain generates physiological paths and as a consequence we use drugs, alcohol or chemical medication that create addiction but help us to forget the pain. It is how Western psychiatry and modern medicine resolved the big problem and how modern society is hiding a huge and ancestral pain: Solastalgia, the pain for a lost home and the nostalgia and melancholy for the peace instilled by living in a natural or aboriginal family and community surrounded by wilderness.

Perhaps, our hurts or pains are coming from ancestral memories. We lost our connection with the earth, with “Mother Earth” what is referred to by many aborigines or native cultures around the world like Hopis from North America, or Mapuches and Koguis from South America or aborigines from Australia and New Zealand, amongst others. How many thousands of years of Solastalgia we have been experiencing? These folks still perceive and feel Earth as a Mother and Goddess, as a live spirit with emotions and perceptions. For those native and original cultures still with ancestral memories, “She, the Earth” is a common personification of nature that focuses on the life giving and nurturing aspects of nature by embodying them in the form of a mother. For instance, in Inca mythology, Mama Pacha or Pachamama is a fertility goddess who presides over planting and harvesting and causes earthquakes. There are many images of women representing Mother Earth

or Mother Nature, and they are timeless. In prehistoric times, goddesses were worshipped for their association with fertility, fecundity, and agricultural bounty. Priestesses held dominion over aspects of Incan, Algonquian, Assyrian, Babylonian, Slavonic, Germanic, Roman, Greek, Indian, and Iroquoian religions in the millennia prior to the inception of patriarchal religions.

Therefore, if Solastalgia “as a concept” coined after seeing how a current and aboriginal Australian community is suffering distress after scarcely 20 years of experimenting destruction of their territory or land, then thinking in our genealogical tree and assuming that we are connected with our ancestors through the genes and many generations of DNA replication and information, I conclude that every person in this planet is suffering Solastalgia, because after many generations we are not more conscious connected with our house, and when I say our house I refer specifically to our planet, our Earth. To me the Earth is the only house I have, and I felt sadness everyday with a pain in my heart after seeing all the destruction we have created in the original paradise that this planet was some time ago. It is like generations over generations we had forgot how respect and feel gratitude and love for being part of the same eco-system, it is like an organelle inside the cell forget that is part of the cell or and organ is part of the body. It is because we forget that we are the sons of the Earth and the Earth is the big mother who feed not only our bodies but also our souls.

Are we artists able to create healing experiences in order to help the future generations to cure solastalgia?

Recapping Dewey: “An experience” is one in which the material of experience is fulfilled or consummated, as for example when a problem is solved, or a game is played to its conclusion. For Dewey “life is a collection of histories, each with their own plots, inceptions, conclusions, movements and rhythms. Each has a unique pervading quality” (57).

So I wonder? If an experience is deeply connected with the complete body, that includes cells and organs directed by the brain and nervous system as the director of an orchestra, if it is always heading for the emotions, because an individual's state of mind is interacting with biochemical (internal) and environmental (external) influences; if it is associated with mood, temperament, personality, disposition, and motivation. Are we then able, after several experiences, to change the DNA patterns and create new behaviors that in the end will be inherited by the next generation? Could we change our DNA patterns if we change our behaviors now? And then we would create a new legacy for future generations: people who feel love for the earth and are at peace living on a beautiful planet? Could we change the future of the planet if we collaborate to change the environment? Similarly to the way a cell changes the physiological paths to create immune defenses

in order to protect the organs and the whole body. Finally, how can we, as artists, create emotions through an artistic experience that can change our perception of the environment and the Earth?

Many of these questions can be answered in the spirit of Albrecht when he coined the other term Soliphilia, meaning the solidarity needed between all of us and the need to be responsible for a place and the unity of interrelated interest within it. Solastalgia will be overcome only when sufficient numbers of us act in solidarity to defeat the forces of desolation (Albrecht 2010, 12). Or, as Albert Schweitzer said, "ethics is nothing else than reverence for life." In all aspects of life - social, cultural, psychological, political, scientific and economic - we as humans need to redirect our energy and intelligence to an ethically inspired, urgent, practical response to overcoming the causes of solastalgia (Albrecht 2007, 36).

Part four: Artists working for Planet Earth and video projections that inspired me

For the last two years I have had the opportunity to investigate and see many artworks and artists around the world. I always have my eyes open and focused on those artists who conceive their pieces in support for planet Earth. As a result I found two main groups: one creates electronic artworks (Knebush) and the other makes Environmental Art, an expression coined as an umbrella term to encompass eco-art/ecological art, ecoventions, land art, earth art, earthworks, art in nature and even a few other less-common terms (Bower).

In his work "Planet Earth in Contemporary Electronic Artworks", Julien Knebush describes four electronic groups of artists focused on Earth for the last decades. The first group sees the planet as an object in space, the second sees it as something virtual, the third as an emotional and sensitive being and the fourth as an experiment. He mentioned the following artists belonging to these groups: Frank White, Tom Van Sant, Joachim Sauter, Gloria Brown Simmons, Fred Forest, Roy Ascott, Takemura Collective, Goto & Collins, Lorella Abenavoli, Stepan Barron and Ingwaz. Knebush concludes "these artworks remind us, rather, as suggested by the philosopher Sloterdijk, that humanity is returning to Earth, having discovered that the cosmos is infinite and uninhabitable".

For Environmental Art I found around 150 Artists, and close to 22 Scientists & Art/Science collaborative projects, organizations, programs and residencies focused on this Eco-Art movement, a number that still is increasing (Greenhouse). Some of my preferred and inspirational artists are Newton & Helen Mayer Harrison, AMD&ART/ T. Allan Comp, Jean Paul Ganem, Tim Collins & Reiko Goto, Yolanda Gutiérrez, Patricia Johanson, Lynne Hull, Ichi Ikeda and Aviva Rahmani. These are

artists I admire because they are working for restoration of ecosystems and protection of watersheds using models for sustainable restoration.

One of my strongest inspirations are The Harrisons who have developed “visionary projects often led to changes in governmental policy and have expanded dialogue around previously unexplored issues leading to practical implementations throughout the United States and Europe”. Nowadays, their project The Force Majeure “expresses a co-evolving set of circumstances, initially brought on or exacerbated by the processes of civilization, and increasing dramatically from the industrial revolution to the present” (The Harrisons).

All the artists I mentioned above influenced my work as a scientist/artist now and will continue doing so for the next years. But also I want to mention two video artists who encouraged me to create Verde Oscuro. First Krzysztof Wodiczko a polish artist who began developing public projections in 1980 as large-scale slide and video projections on architectural facades and monuments. Today he has projected around 80 public projections around the world in countries like Australia, Austria, Canada, England, Germany, Holland, Ireland, Israel, Italy, Japan, Mexico, Poland, Spain, Switzerland, and the United States (Krzysztof Wodiczko). And second Craig Walsh, a new media artist who often utilizes projection in response to existing environments and landscapes. He explores “the history, occupation and contribution to a place beyond the selective history immortalized in the permanent public monuments and plaques visible in many public spaces” (Craig Walsh).

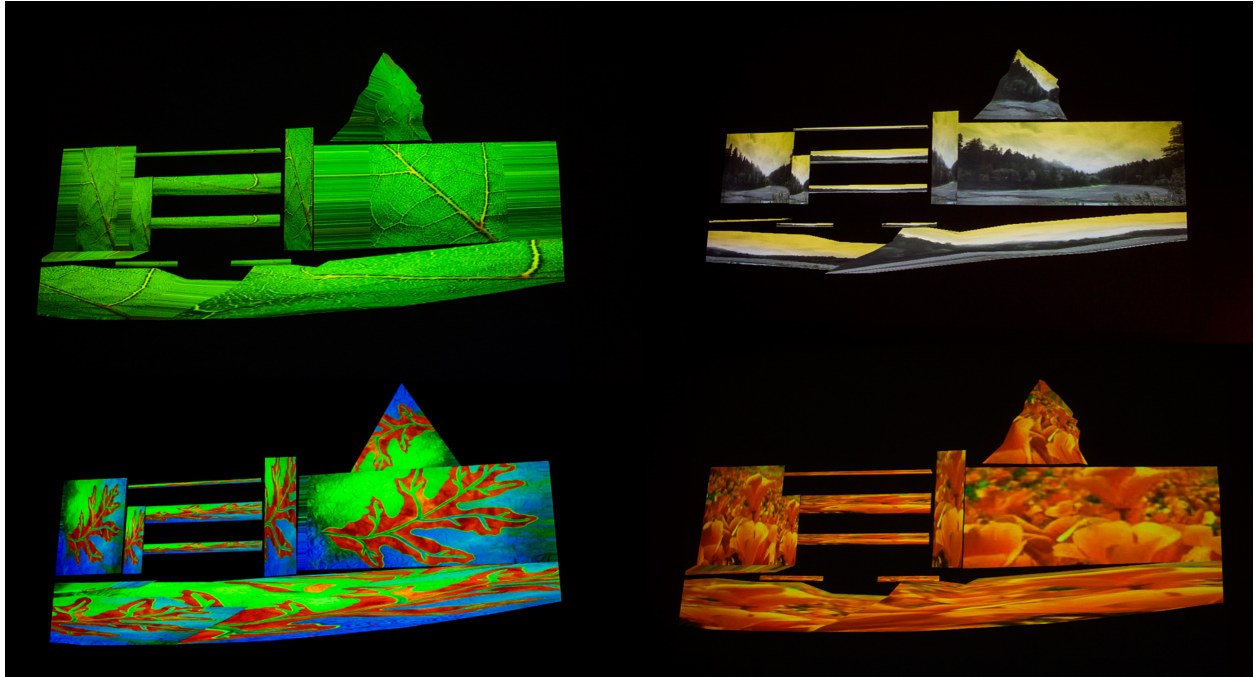


Krzysztof Wodiczko, The Hiroshima Projection 1999

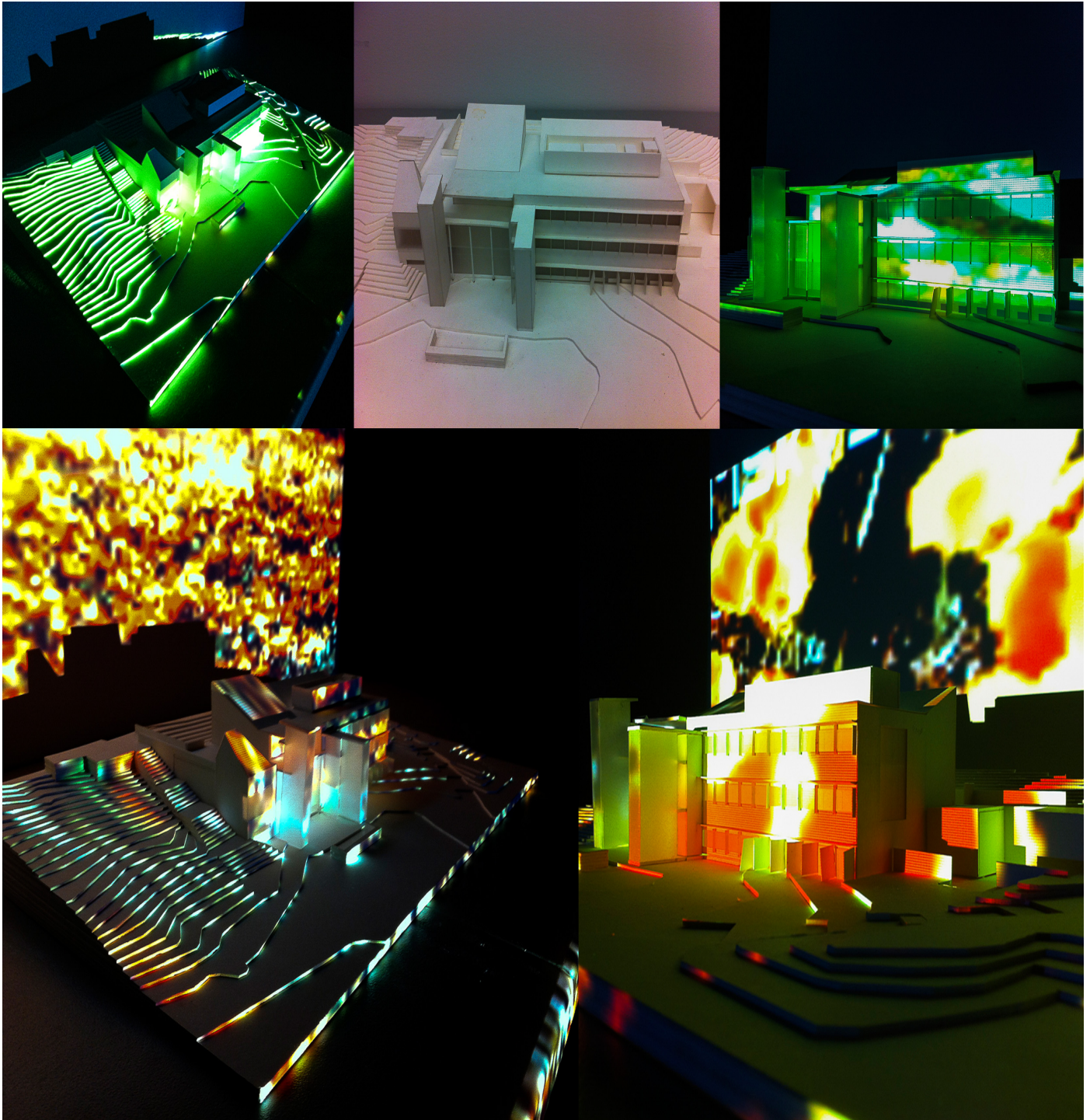


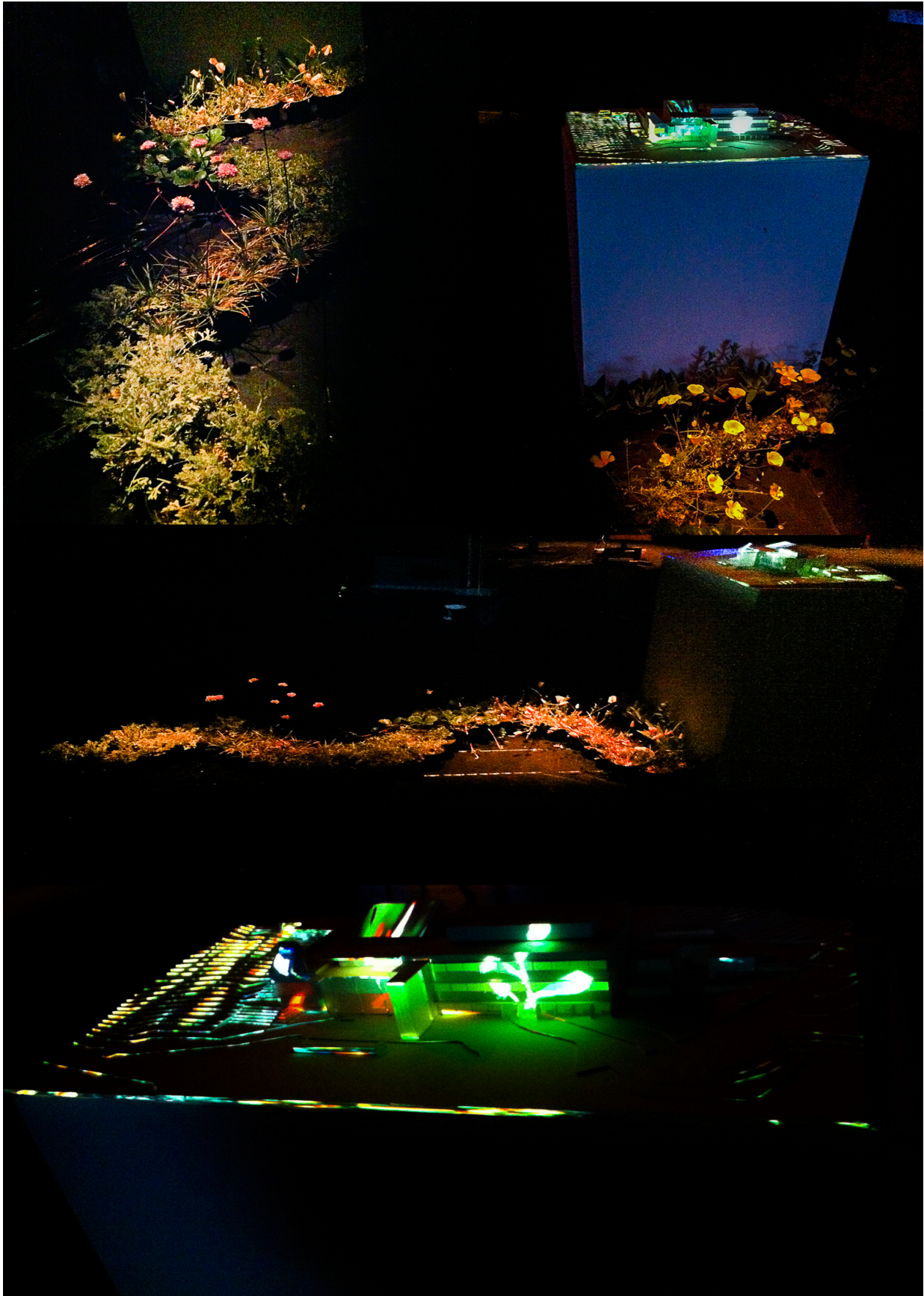
Part five: The prototype and screen projection
Craig Walsh, Spacemakers 2013

The prototype is the first experimental working symbol using one of the original models for the DARC building that was made by the architecture design firm. As a first full-scale and functional form the model helped me test the concept, confirm the process and visualize how the final projection takes shape. Before making a projection over the model I started using a DARC's picture over a wall and play with different designs as you can see in the figure.



For the piece exhibited at the dark room in a small-scale demonstration I used one standard projector, one speaker, two chairs and the six native plant species in a shape of Wave River. During the day the audience can get an idea outdoor projection but it is also a space to talk, explain the installation and answer questions about the whole concept of the project and the main projection outdoors.





Part six: Video Mapping Projection

Virtual realities can be used as an instrument to change thoughts and create experiences to develop new realities that can emerge after visualization. Nevertheless, virtual reality cannot be compared to our actual reality. For instance, I can see somebody embracing a tree through a projection on the wall but it never will be the same as embracing the tree myself.

The final piece or the video mapping projection happen on the 2nd May 2013 at 8.30 pm after the opening speech. To have a complete piece I tested the projection four times before the opening (February 2nd and 22nd, April 5th and 30th of 2013). The set up id accomplished through teamwork with experienced people who advised me during the process and who I am eternally grateful to (Gene Felice, Drew Detweiler, Tina Hands and Eve Warnock). To make this project possible, I acquired permits after many interviews and e-mails answering questions about safety assesment. The staff involved was Geoff Gerard, Lyle Troxell, Dave Morrison, and Brent Cooley. Anytime we testedthe projection, Tina Hands drives the lift scissor from DARC to the Music Recital Hall. The best spot to project was identified after testing different placesd and having the required permits for the safety staff. Lyle, Gene and Drew clarified technical questions.



Tools and equipment I utilize to make the projection

The Lift Scissor –the Genie-GS2032-, 1 support wood’s table, 3 Softwares -Modul8 and MapMapMap-, Final Cut Pro 10 and MPEG streamclip. 2 Projectors (Sanyo), 1 Matrox TripleHead2Go Three-Monitor Graphics Expansion - Digital Edition T2G-D3D-IF, 1 Laptop (MacBookPro), 2 Speakers in front of DANM, Cable extensions, 2 Cameras (Digital Canon xs and Canon 5D).

List participants and individuals involved in project creation and design.

Catalina Giraldo, Tina Hand (Lifts Scissor Driver and Technical adviser), Gene Felice, Drew Detweiler (Technical DANM advisers), The Greenhouses of UCSC (Jim Velzey, Director and staff) Newton Harrison, Helen Harrison, Soraya Murray, Erika Zabaleta (Academic Thesis Committee) Shelby Graham (Curator).

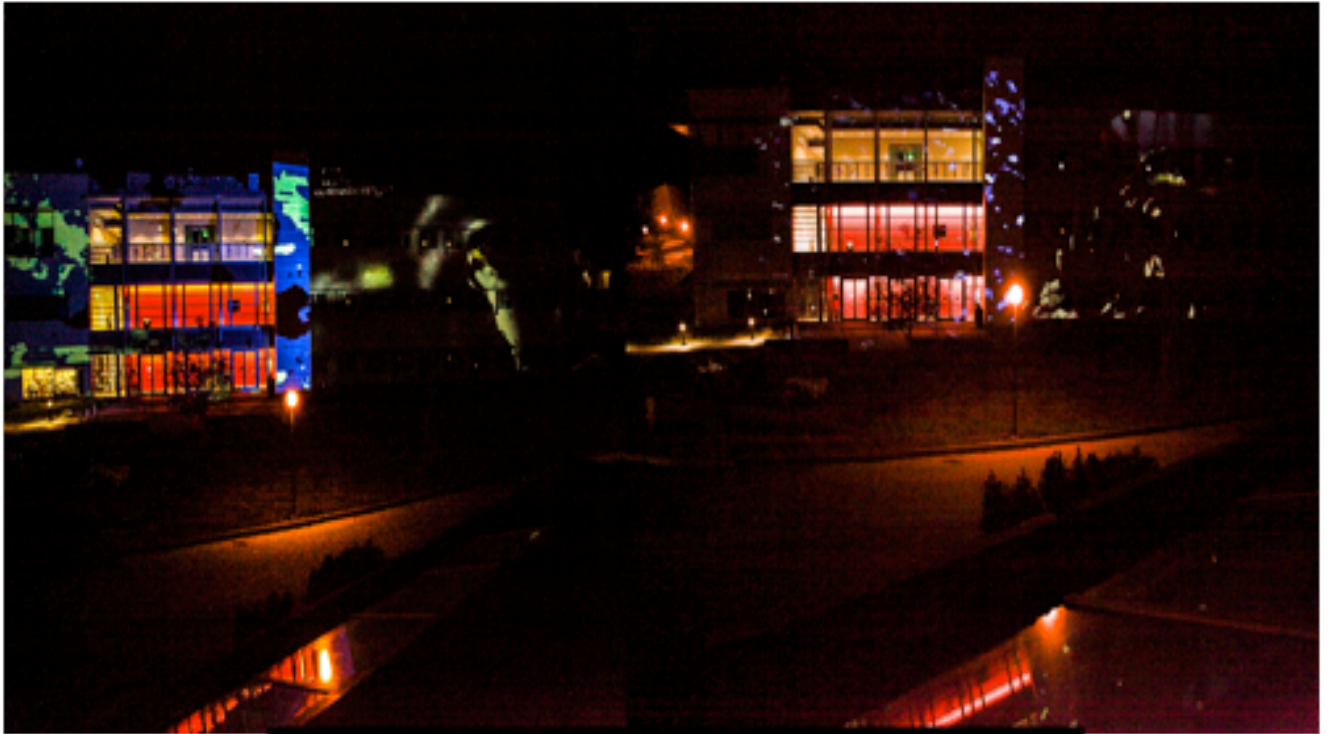
Second Set-up on February 22nd 2013

I started out using 1 projector and 1 laptop for the first set up when I use the lift scissor. It helped me realize that I would need two projectors to mask the whole building.



Third Set-up on April 5th 2013

This time I use 2 projectors, 2 laptops. I assesses that two projectors are enough to cover the whole DARC buiding. However, to project a story I decide to use one computer and 2 projectors. After some research we found the triple head as a solution.



Fourth Set up April 30th 2013

It is the last set up using 1 laptop, 1 triple head and 2 projectors. The last test is important to make sure I'd know how the video looks and what changes I should make in order to have a better projection.



Photo credit: Gene Felice 2013

Final Projection May 2nd 2013 Ground (ctrl) opening at DARC

The complete piece lasted 13 minutes. 1 minute for the title and introduction, 3 minutes for the past, 2 minutes for the present, 5 minutes for the future and 1 minute for acknowledgments. The render is due editing fragments of videos from YouTube and Vimeo. Scientists and artists I identify below made the videos. For video editing and render I use Final Cut Pro 10 and MEPEG streamclip.

The music is edited in collaboration with Huascar Garcia a PhD student at the UCSC Music department, using GarageBand Mac application. The musicians, tracks and albums are identified below.

For the final projection I create two screens dividing the building into two sides. Using modul8 I mixed two videos on each screen and create a total of 4 videos. Each one lasts 11 minutes and they are totally connected to the music.



Introduction

Minute 0:00-1:00

Music:

Title: Verde Oscuro

Subtitle: Verde Oscuro: A Short travel through the past, present and future envisioning the ecological history of this building.... THE DARC....

Past

Minute 1:01-4:04

Sound songs credits: Track-Thunder Wolf- Artist *Ron Korb*, Album -Our Native Land-. Sounds of fire, rain and sews are part of the mix.

Video Credits: Redwoods by Roman Khomlyak Photographer, Reedwood Saga by Guy D. Haseltons. Growing is Forever, by Jessy Rosten, Falcon Peregrinus by BBC Natural History Unit, Diverse animations by shutterstock.



Photo credit: Gene Felice, Soraya Murray 2013

Present

Minute 4:05-5:59

Sound songs credits: Track: Fox Tail, Artist: Ikue Mori, Album: Labyrinth.

Track: Two songs for tape bow violin: ethics is the esthetics of the few-ture (Lenin) Song for Juanita, Artist: Lurie Anderson, Album: Airwaves

Video Credits: DANM old projects by diverse students on Vimeo, animations made by Shutterstock



Photo credit: David Moody, Soraya Murray 2013

Future

Minute 6:00-12:59

Sound songs credits: Track:
Evolution, Artist: Dante Bucci,
Album: Reminiscence.

Track: Budda Nature, Artist:
Deuter, Album: Budda Nature.

Video Credits: Poppies,
Lancaster CA by Moving Art,
The beauty of pollination by
Moving Arts/Louis
Schwartzberg, People and
Forest by Mamoru Kano,
Acorn to Oak-time lapse- by
Neil Bromhall; Prunus-Time
lapse- by Waildwater.tv,
Timelapse of growing plants
by Vimeo group, MujerArbol
by Liset Alcalde-Artist, Visions
of Nature by Kurt Reinhart.



Photo credit: Gene Felice, David Moody, Soraya Murray, Catalina Giraldo 2013

Acknowledgments

Minute: 12:00-13:00

Text:

This project was made possible with the support of many friends, faculty and advisors.

They include: Professors Helen-Mayer Harrison, Newton Harrison, Soraya Murray and Erika Zavaleta. Additional support was provided by Felicia Rice, Lyle Troxell, Gene Felice, Drew Detweiler, Tina Hand, Elliot Anderson, Shelby Graham, Eve Warnock, Pelham, Matt Jamieson, Danielle Williamson, David Moody and all the students of the 2013 and 2014 DANM cohorts.

Other contributors were Jim Velzey and the UCSC greenhouse staff and Huascar Garcia who edited music.

Financial support was provided by the Porter College Fellowship and the Graduate Students Association.

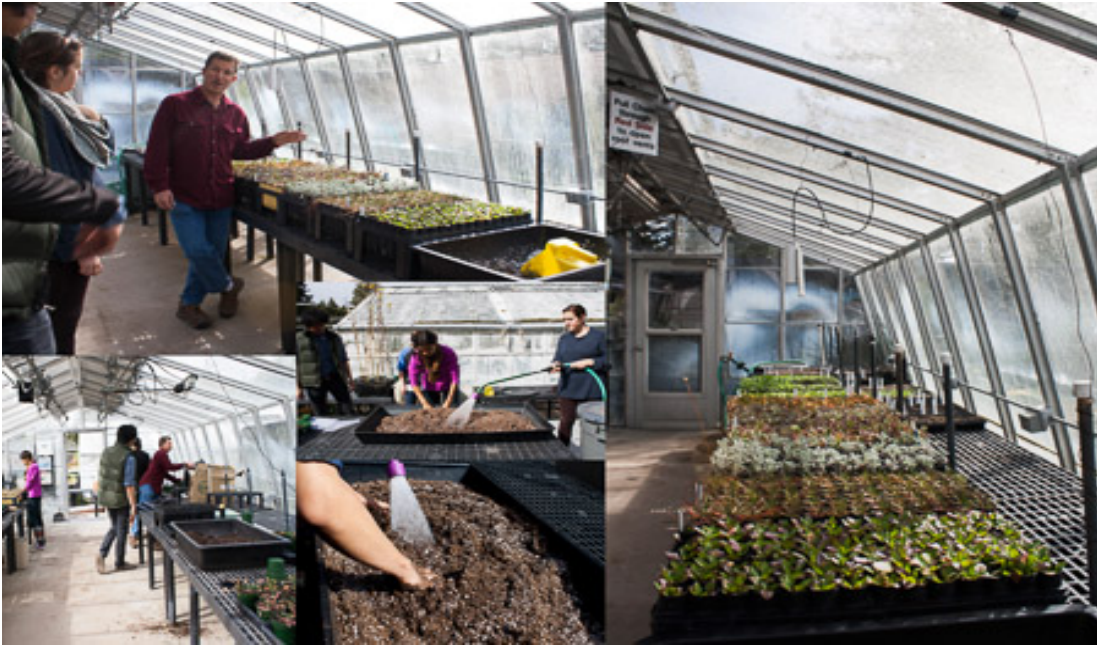
Finally, I am grateful for the love and compassion of my friends and family in Colombia who have supported me from afar through the duration of my studies.

And of course, to Mother Earth, my ultimate provider, muse and inspiration.

Part seven: The Live Plants Installation indoors and outdoors

The live plant installation complements the mapping projection with native California plants. I am using native plants because they are easy to grow, they are already adapted to the soils and weather, they don't need fertilizers and pesticides, and once they are established the water needs are in balance with what nature provides (Montgomery 1). At the same time they provide food and shelter for birds, butterflies, bees and they generate an atmosphere where the human body feels happy, relaxed and creative since nature promotes positive emotions, psychological resilience, and wellbeing. Some researchers have demonstrated that pleasant environments stimulate opioid receptors so we actually feel a sense of pleasure when we are close to nature (Heerwagen).

In addition "native plants species existed in California thousands of years before the arrival of explorers and colonists. Approximately 6300 native species, subspecies and varieties have been identified and new discoveries are still being made. A third of these plants are endemic, that means restricted to a single locality or habitat" (Poper).



The process is carried out at the Greenhouses-UCSC under Jim Velzey's direction. It is a communitarian practice that started on the 7th March 2013. With the help of some volunteers we transplanted around 500 plants to a new pot. Then plants were under nursery care for two months until the pre-opening on April 26th 2013. I first moved half of the plants to the DARC, the next half was moved to DARC for the main opening on May 1st 2013.





Each pot has a label with a corresponding scientific name, common name and the ground (ctrl) symbol we used for the DANM-MFA 2013 Exhibition. The plants are displayed mainly on the first floor and outdoors in front of the building. Some plants are displayed on the second floor.

Pots are placed around the audience during the main opening on 2nd May 2013. The plants are part of Eve Warnock's performance and also the speech of DANM Program chair, Noah Wardrip-Fruinand and the Ground (Ctrl) MFA's Curator, Shelby Graham. After the projection (looping 39 min) people are invited to take a plant for free and plant it in their yard with the aim of dispersing native California plants and creating a sense of grounding and connection with Mother Earth. At the end of the Exhibition on 5th May 2013 all the plants were taken and hopefully planted around the San Francisco Bay Area.



The Plant Species I used are described here according to Poper (2012).

Eschscholzia californica

California poppy

“Early Spanish explorers sailing along the California coast observed the hills blazing with orange-colored poppies and described it as the “land of fire”. They named the flower *copa de oro*, meaning cup of gold. The California poppy was chosen as the state flower in 1903 for its wide distribution, brilliant color, satiny flowers, and long flowering period. Depending on climate and exposure, plants may bloom from February all through the summer. Poppies are among the most adaptable of

all wildflowers, and they require little in the way of water or cultivation. These colorful flowers are valuable for dry sunny areas with other wildflowers and grasses”.

Artemisia pycnocephala

‘David’s Choice’ sandhill sagebrush

“This is a superb, compact selection of sandhill sagebrush with silver-gray leaves. It forms low mounds and is best in coastal gardens. Removing flower heads in late summer helps maintain its attractive appearance and form”.

Armeria maritime

Sea thrift

“Forms a tufted mound of evergreen, grasslike leaves. Small, round pink flowers are held on slender stalks above the foliage. They bloom from late spring to early summer, and cutting back old flowers will prolong the season of bloom. Plants tolerate full sun along the coast and prefer some shade inland. This hardly perennial is effective in front of mixed border, along paths, and in containers”.

Lupinus nanus

Sky Lupinus

“The experience of walking through sky-blue pools of fragrant lupines is unforgettable. They are a prominent feature of open fields, rolling hills, and coastal plains. Sometimes lupines are the dominant plant and cast a blue haze over the landscape, but in most places they mingle with other spring wildflowers. The classic combination of blue lupines and golden poppies is easy to replicate in a native garden”.

Dudleyas

“Are spectacular, long-lived succulents with silver-gray leaves that thrive in rock walls and in containers. They may also be used on slopes, terraces, raised borders, or as endings with other plants of similar requirements”.

Fragaria chiloensis

Beach strawberry

“This species is native to coastal beaches and bluffs of California and Chile. A parent of the commercial strawberry, beach strawberry is mainly used as a groundcover. It tolerates full sun near the coast and requires some shade inland. It is useful as a turf substitute or groundcover between larger plants. Mowing or cutting plants back in spring will stimulate new growth and prevent layering”.

Part eight: Verde oscuro audience and reception

I feel I have created an experience on the 2nd May 2013 that close to 250 people took part in, in some way. I asked people after the show “what was your perception, understanding of the projection and plant installation? What sense did you get and what emotions did you experience?”

As a general answer I found that people liked it, they thought it was beautiful, it was positive and it created a sense of grounding.

Some of the answers were:

I enjoyed the lights although I saw it very abstract.

I didn't see a storyline but I feel it was about the forest and the earth.

I like the image about the guy climbing.

I like the flowers opening and the birds flying.

It creates a sense of hope.

I couldn't see pretty good maybe because I was so close.

About the plants:

People loved the idea to have a plant in their house. And some considered that an act of generosity.

Conclusion

Verde Oscuro is an experiment that I imagined a year ago as a dream. Verde Oscuro took shape after many changes during its process. Changes I made answering challenges and following intuitions. Verde Oscuro is not only a piece of art; it is a collective experience that creates a sense of community. The first community is the collaboration between Arts and Science Faculties. The second community was between DANM's students or DANMites who, for a year, answered numerous technical questions that a year before had been impossible to for me understood. And the third community was created for 13 minutes during the projection outdoors, and perhaps is still in the air as imperceptible or tangible.

Verde Oscuro as a mapping projection could be still stronger in the future using 3D animation made by a team of animators considering that it requires too much work, experience and budget. To use powerful projectors and speakers located in different places will definitely improve sound and illumination. For a 3D mapping projection it will be necessary to turn off all the lights inside and around the building with the aim of watching the special effects created by this kind of projection.

To have a stronger live plant installation the plants must be planted permanently based on a sustainable garden design with native California plants and food plants outside the front doors and definitely indoors. It will require a list of permits from many different offices at UCSC and a budget. Both 3D animation and a real permanent garden will make the piece powerful in the future.

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