

Intensive Combine

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Praxis II, Systems Intensive

Reflection

Since I have well established that my dissertation topic is about water, I have found that many of my conversations lead to the issues surrounding this vital resource. Here on our planet water touches everything. We humans are mostly water; one might go so far as to say that we (the planet and its inhabitants) are all about water. And we are a system...

Donella described systems as if they were water; stock, a tank or other container, and flow, the distribution by whatever means. It might be gravity producing natural convection, or a pump creating forced convection. Some of us are moved or held in place by culture or personal whim while others are pushed out of their habitation (displaced, evacuated, made refugees) and/or drawn by confident expectations (hope).

We are not just mostly made of water; we are very much like water. Our lives begin and grow in the watery world of the womb. We are delivered into the arms of humanity by a raging, crushing torrent. We pool in a subsystem where if we are prohibited from interaction with other subsystems we become stagnate and grow only a substance with a putrid stench. However, if we are integrated with other subsystems the stock of each flows freely between and within, enlivening our being.

The difference between these paradigms is the definitions of rigid, inviolable boundaries acting as walls, fences, bulwarks against the others. Here there will inevitably be the dominant and the subjected. That which is most powerful might be benevolent or tyrannical; but there will always be division precipitating the haves and have-nots. When bridges are built instead of walls, like a gravity fed conduit, we are free to flow from one stock to another; there is comity and sharing.

The chemistry that must be mixed into the immediate system must consist of curiosity, rather than cowardice and connectedness rather than detachment

## The Hike

Nature presents as a myriad of systems awaiting discovery (CNPS, 2012). The very dirt exhibits a stock and flow as the wind or water interact and effect flow into a dynamic shape and consistency (Dibblee, 1950). Then, these fluids, as they modify the dirt, the dirt then effects change on the flow and/or stock of them (Meadows, 19XX).

More radical system alteration occurs as the churning magma beneath creates seismic cataclysm making the simple dirt move and sometimes melt. But the impact of the human system has been in evidence as mountains are burrowed through, cut down or shaved to make way for an elaborate human transportation or subsistence systems.

Nature's hydrologic system consists of what would seem innumerable stock settings which exist in at least three apparent phases, of liquid, vapor and ice. These traverse methods of flow by way of gravity, evaporation and precipitation. While on its journey dihydrogen monoxide naturally negotiates the systems of geology and meteorology (Campana, 1975).

The San Ysidro Creek, as with many others, has cut the landscape of the Santa Ynez Mountains for many centuries, shaping a canyon that would one day be the home to several elements of the human system. The encroachment of humans into nature brings petroleum based road surfaces leaching into the soil, public utilities with their electromagnetic radiation and gas lines leaking unnatural concentrations. Add to this the sewage removal system with its toxic leaks and humanity brings a potentially catastrophic intersectionality of systems.

In parallel with the bed of the stream are several old decaying piping runs exposed by erosion. There is even a legacy hydro-electric system near the McMenemy

trail head (David, 2017). Less offensive alien invaders are the various non-indigenous floras such as the beloved eucalyptus abound. Being overly thirsty these only exacerbate the already arid condition. With the coastal system in a drought situation this intrusion, as with others, contributes to the potential creeping environmental disaster.



Ferns



Nasturtium



White waterleaf

...and others spring to life along either side of the creek bed; each a subsystem integrated with the creek and the soil. In some cases the flora grows from within the creek system. This would include the nasturtium as well as water cress and stinging nettle. These three plants can be utilized as a food source when properly prepared.

The meteorological system which develops as a result of the intersecting geological and horticultural systems has the occasion of presenting a significant transformation and transmission of the



fluid stock from the atmospheric vapors flowing by way of precipitation to the bed of the creek. When the stock boundaries of the creek bed is insufficient to contain the volume

of this liquid presentation the shoreline is modified to accommodate. The trees and other plants, as well as rocks become a part of the creek being altered according the force of the water flow.

The California Live Oak, Sycamore and Alder congregate in the valleys close to the stream. The oak were ever the staple of the indigenous tribes, especially the local Chumash. The acorns were harvested, ground up and then the acidic acrid flavor removed by pouring water through the resultant meal (Lawhead, 2002, p.35). The Chumash would occasionally bend a sapling sycamore as it grew to make it grow to the side as well as up. This was to signify an important site (Wallace, 1954). The alder was used for various medicinal purposes, such relieving diarrhea. In addition the bark can be used as an anti-inflammatory. With these and other natural healing and health methods the tribe maintained a relatively healthy lifestyle without the aid of modern medicine...until the "old world" diseases were introduced in addition to the unhealthy diet and life-style.



Along the McMenemy trail to the Stone Bench the drier land supports scrub-oak, manzanita, Matilija and California poppy. The trail, a meandering series of switch-backs that traversed the side of the various hills, works as a human made system leaving an apparently benign scar on the mountain's slopes. The occasional appearance of edibles, such as Brodiaea, indicate the further presence of life sustaining sustenance available for the local tribe with little effort to harvest, clean and eat, raw, roasted or added to a soup or stew. The anise, though providing minimal nutritional value, added a sweet flavor to satisfy the Chumash sweet tooth.

The route to the Stone Bench provides numerous venues for scenic views. The angles seen of the San Ysidro canyon and the Channel Islands are breathtaking in spite of the evidence of urban sprawl. From the Stone Bench, on a clear day, the panorama stretches from Hope Ranch to beyond Carpinteria though not quite to the Rincon, the geographical corner, where the Ventura River empties into the Channel. But those are other systems, though associated, beyond to scope of this hike.

The hike covered about three miles for the round trip. Though this does not seem an arduous trek, the elevation change was about seven hundred feet (from 34°26'36.85"N & 119°37'22.17"W to 34°27'8.40"N & 119°37'44.99"W, Google Earth, November 10, 2016, April 6, 2017). This attribute of the trail system, traversing the canyon and hilltops, added the most difficult element of the hike. The need to carry one's body, at about 93 kilograms, made the process much more demanding on the author's human cardiovascular and pulmonary systems.

An added component that can make any route less strenuous is a companion with whom to experience the journey. The system of simple human association brings an inner strength that can be marshaled to overcome many an obstacle. Just as much as "many hands make light work" (Heywood, 1906) many hearts together can endure much hardship.

## The Community Environmental Council

The Community Environmental Council (CEC) began its work as a response to an environmental catastrophe. The leak from an oil platform in the Santa Barbara channel left the ecosystem and its inhabitant's devastated. The initial and continuing practice involved establishing bold goals which placed the organization in a position of early adopters of innovative solutions to the issues. In this position a role as an "influencer", with the power to impact public policy and personal behavior, developed as the council was used as a consultative entity for a growing and evolving community (Clarke & Hemphill, 2002).

Evolving into an environmental entrepreneurial entity, the Community Environmental Council has developed programs, plans and processes which eventually have been "spun off" as other organizations took on the specific challenge.

Partnering with other social ventures and coalition building has become a major component of the effort engaged. Those which were birthed by CEC include Fossil Free by '33, The Food Action Plan, America the Possible, Environmental Defense Center, et al. In addition the CEC has reached out locally through institutes of higher education especially Santa Barbara City College and the University of California Santa Barbara where there are very active environmental science programs. Through these courses of study students gain a better understanding of how humanity is intimately connected with the environment and how our activities impact and are impacted by the environment. Students are uniquely prepared for careers in the fields of natural resources, land use planning, business, energy, waste management, pollution control, law and environmental administration. With the heart of somatic consciousness (everything is interconnected) at the core the future leaders of the environmental movement will be prepared to argue from the standpoint of scientific fact (CECSB.COM, 2015).

CEC leadership has socialized environmental issue with the agricultural community so as to enable their understanding of impacts from the various methods of fertilization and pest control. This works to ensure that the farmers and ranchers are aware not just of the negative processes and their destructive nature but that they are introduced to environmentally friendly methods (Sigrid Wright, CEC CEO/Executive Director, personal communication, March 15, 2017).

Some of the current issues being pursued include: identifying the fully burdened cost of consumption by way of a full life cycle analysis; thus, cost and compensation for those in the supply chain can be adjusted to more accurately express the cost; promotion and maintenance of social harmony by acculturating a sense of common responsibility at the earliest point of the education process; return of the commons to the public away from the principle of privatization; Fund for the Future, a Citizens climate tax, and others (Sigrid Wright, CEC CEO/Executive Director, personal communication, March 15, 2017).

Other programs oriented to a move to sustainable energy are the Solarize Program, Community Choice and Green Car shows. Through these CEC has helped to increase the use of solar power such that the tri-county region (Ventura, Santa Barbara and San Luis Obispo) now has over one billion watts being produced; enough to power almost 250,000 homes. Community Choice Energy is also a leading local advocate in deriving power from locally generated sources. Due to the increase of electric vehicles, the demand for public charging stations had led to 360 stations in the region (CECSB.COM, 2015).

The CEC is actively involved with getting vital information out to the public. Through Twitter tweets, email subscriptions and RSS feeds, concerned citizen are made aware of breaking



news on the various subjects of environmental and social injustice. In addition the CEC hosts various blogs addressing these issues (CECSB.COM, 2015).

The Rethink Food drive is intended to drive away from the concept of agribusiness and mega-farms and ranches where the bottom line is financial profit. Since the mass production model seems to produce, not only an inferior product compared to the traditional farm or ranch, but also tends to be rife with inhumane animal treatment as well as unhealthy process conditions (Kenner, 2009).

The lesson to be learned from observing the Community Environmental Council journey is that if a few people filled with passion define a basic vision to pursue it can manifest much greater fruit than was originally expected. Almost fifty years ago the intent was to cleanse the beaches and wildlife of the Santa Barbara and Ventura county coastal regions while engaging social action influencing policy makers to eliminate or at least reduce the volume of petroleum being processed; picking up the refuse on the beach and washing oil off of sea birds became a globally influential group on the cutting edge of social and environmental justice and responsibility.

The CEC has essentially developed a system of processes with which a given issue is pursued. In some cases additional agencies are partnered with to advance the process or the effort is taken over leaving the CEC in a consultative role. In effect the CEC is an entrepreneurial entity for addressing issues of social and ecological injustice; creating and then spinning off social action oriented processes and organizations. Thus; beautiful rabble rousers...may we ever stir things up.

## The Santa Barbara City Water Commission

The Santa Barbara City Water Commission was created by the Santa Barbara City Council in 1900, tasked with the administration of water services. Since then, as the city has grown, the size and complexity of the organizational system has grown as well. The currently customer community consists of the cities of Santa Barbara, Montecito and Carpinteria.

The Santa Barbara City Water Commission consists of five members each of which must be qualified electors of the city. The term is four years and until successors are appointed and qualified. Staggered terms expire at the end of the appropriate year. The Commission meets once each month. Members must file a Statement of Economic Interests upon appointment, annually and when leaving the advisory group.

In addition to the elected commission the City of Santa Barbara has established the department of water resources under the directorate of public works. The department of water resources consists of several groups for specific tasks such as water distribution, meter readers, water treatment, wastewater systems, laboratories, wastewater collection, wastewater treatment and water supply management (Taylor April 3, 2017).

The commission and the water resource department operate under the standards defined in the Santa Barbara Municipal Code Title 14 - Water and Sewer (City of Santa Barbara, California, 2015). From these high level requirements the various plans, processes and work instructions are derived and applied in the several aforementioned groups.

Currently there are seven sources utilized for the various customer requirements of the district. This expansion of the supply base has been necessitated by the increased demand resulting from the increasing permanent population and the growing industry providing entertainment and accommodations for travelers and vacationers. This has worked together with the natural state of the area being semi-arid and prone to regular droughts.



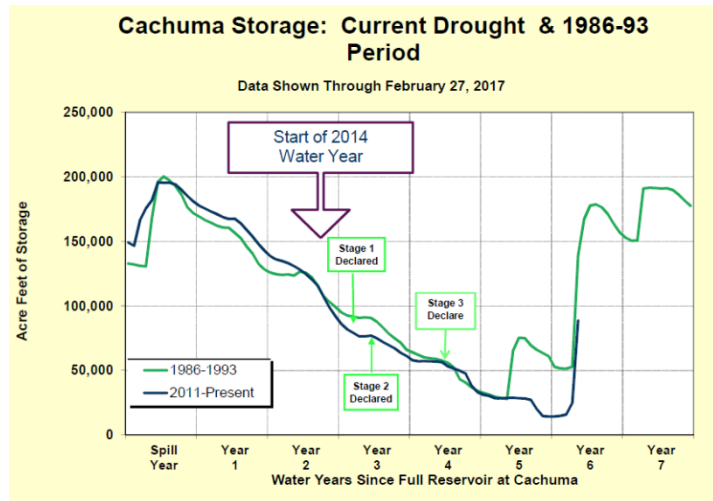
Figure 1 - Current Water Sources



Figure 2 - 1980 Water Sources

This supply scheme is as compared to the situation over thirty years ago when there were only three sources of water. The historical data from the period of drought running from 1986 to 1993 showed the level of Lake Cachuma, the main source of water supply, going from near maximum capacity (193,305 ac-ft) to about 18% of that by 1991. At the rate of use, if the drought had not been stemmed by a return of average weather and therefore rainfall, the lake would have had only enough for just about a year of supply. This assumes that every last drop could have been used which is not the case (Taylor March 15, 2017, slide 28).

The current drought has been determined to be the worst that has happened in recent history. Even with the added water supply sources, the depletion reserves in Lake Cachuma (the major source of water) has followed about the same trajectory as the earlier drought (as can be seen in Figure 3). This could be accounted for by the change in population for the customer base. [Figure 3 -](#)



[Cachuma Storage Graph](#)

The combination of the various water supply sources as subsystems into the whole of the Santa Barbara water system could perhaps be an important agent in saving the area from a slow moving environmental disaster. This remains to be seen since the drought is still assumed to be underway. In only the last five hundred years there have been numerous periods of drought ranging in duration from 10 to 60 years (Veblen, et al, 2013). The only difference between those situations and that of our current state is that the population, and therefore demands on the natural hydrological systems, is many times greater.

The efforts ongoing at the Santa Barbara Water District to ensure meeting the mission statements goal have been inventive and creative while operating under the stress of an arduous situation. It can be imagined that each member of the commission and professional staff regularly are asked about the water supply situation with the implication that it is somehow their fault or that they are not doing enough. The

construction of the dams that created Lake Cachuma and Gibraltar, the engineering behind bringing that water to the city, the tunnels and piping systems, valves, pumps and the motors which drive them and then the desalination plant are monumental tasks and should be grounds for praise of this organization.

Still the issue of sustainability and environmental justice must be taken into consideration for the future as we ensure that we do not destroy or corrupt the source of our resources.

The human elements of the City of Santa Barbara department of water resources organization walks in parallel with the physical systems which are constructed in, and with, the natural systems of this paradisiacal location. Each group or crew works according the system of policies, plans and procedures to achieve the goals of their particular subsystem. The natural system, unfortunately, operate on their own schedule, which, though humanity has devised "sciences" in an attempt to know the ways of nature and predict its movements, yet, they are only best guesses based upon statistical estimates derived from historical data.

Since the efforts of humanity have severely impacted the systems of nature even our best educated guess might not tell whether we will have a future that is anything like the past. The requirements of environmental impact reports for most building projects is a viable method to estimate what our continue encroachment into the natural systems will cause, for good or for ill. Those which are expected to have a negative impact must be frowned upon or that impact compensated for or reduced with mitigating controls.

All systems for the benefit of humanity should be designed with a mind toward benefiting the rest of the inhabitants of the planet as well as the (apparently) inanimate

resources we all require for the continuation and continuity of life. For even the natural systems of geology, meteorology, hydrology, et al, should be considered as all but living. Without this mindset we will trample them under foot as if they were of no consequence.

## Intensive Capstone

The intensive process and presence afforded a discovery of various systems in action. The actions, as flow from stock to stock, was in some cases a meandering stream of water in a quiet valley while another was a bustling feat of modern engineering moving, storing, processing and distributing the same to over one hundred thousand thirsty people, and innumerable plants and animals.

One segment of humanity working as a system to utilize natural resources to provide an absolute necessity for the people; another working as a system to minimize the negative impact of any human effort on the natural resources. And then there is the intensive; a system of human hearts beating in harmony to find a way to a world where all is done for the benefit of all.

The systems of nature quietly engages their age old processes of transporting, transmitting, transferring, transforming, flowing from stock to stock working together to an end we cannot comprehend. Yet we dig and sift, ladle and stew, analyze and hypothesize; but rarely to our hearts content.

The artificial boundaries we draw for the systems we devise are ignored by the forces of the natural systems since these lines are really only in our imagination. Still we struggle to contain the flow in our flimsy stocks or direct it to our shifting will; all this to maintain and then elevate our existence.

Yet this is the nature of all living entities; the Oak drops it acorn which breaks open and, being sentient, reaches for the sun light above and water and nutritious soil below. The virus reproduces itself while feasting on the host it continuously consumes. In the end we are each trying to conquer the world; if this systematic process goes

awry, the source of the essential resource will be corrupted and/or destroyed (Lawton, et al 1994). In addition to the inter-species rivalry, all are subject to the vagaries of climate, whether the local weather extremes (Lorenzen, et al 2011) or impacts from interstellar radiation (Draine, 2009).

When one considers the multiplicity of systems in opposition to the survival of, and in competition with humanity it is a testament to ingenuity and intestinal fortitude that this species continues to exist. This combination of intelligence and willfulness has led to the establishment of numerous organizations (human systems) toward the purpose of survival and as that is attained the comfort and pleasure.

The Goleta Water District is an example of such an organization. Its original purpose was to deal with a severe drought impacting the Goleta Valley (Goleta Water District, 2017). In time it has grown to provide water services to Residential Single family and Multi Family, Commercial Light and Heavy, Irrigation, Agriculture and School, hospital or Institutional (Goleta Water District, 2016).

The unpredictability of the climate in Southern California leaves the Goleta Water District, as well as other such agencies, in a peculiar quandary; when there is insufficient water supply from the most natural source of seasonal rains other sources must be discovered and exploited while on the other hand having sufficient storage volume for the rare deluges (Pagán, et al, 2016).

While in the midst of this struggle the average customer will generally see little change in their expectation of service. A brown lawn might be the worst of the residential customer's fears during a drought or some minor moisture damage during a



flood. These are the major constituents of the of the Goleta Water District Board whose voice would be loudest.

At the same time the least of the customer base, the small scale family farm, could lose sequential years of crops and suffer extreme financial reversals in a drought and then in a flood experience soil erosion with the same net impact. Thus this small segment of society might be the object of social and environmental injustice through the intersectionality of climate changes and the unintended consequences of public policy.

Public utilities, environmental groups can and do work in concert to provide the vital services to the community while also minimizing the negative impact on our natural resources. Though the Santa Barbara area is certainly not where it could be yet it is well ahead of much of the nation and the world in striving for a sustainable reality in every facet of the community. The Community Environmental Council, the Santa Barbara Department of Water Resources and the Goleta water District appear to be moving in the right direction with efforts to work at one with the natural resources and therefore moving toward a time when we will no longer corrupt or destroy the source of our natural resources.

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