Community-University Partnerships as Drivers of Bioregional Science, Policy and Planning

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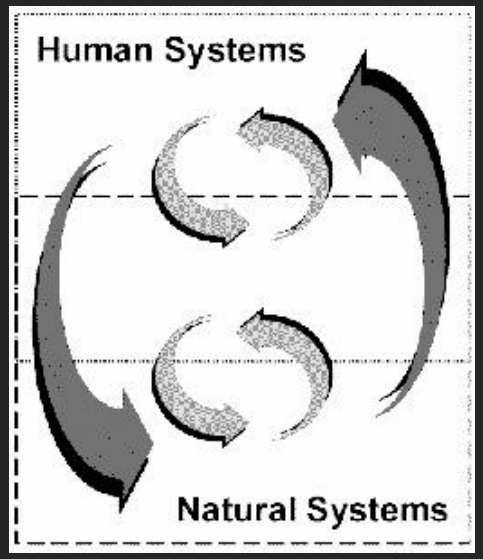
1. **Bioregional Science:** A Framework for Community Engagement and Research Translation
2. **Urban Agriculture and Food Disparities:** Eliminating Superfund toxicants at the food-water nexus in disadvantaged neighborhoods



A Perfect Storm?

1. The global surge in demand for food, water, energy and natural resources.
2. Climate change/ ecosystem degradation
3. War on Science/ systemic flaws

The Bioregion: Green Infrastructure

Bioregion

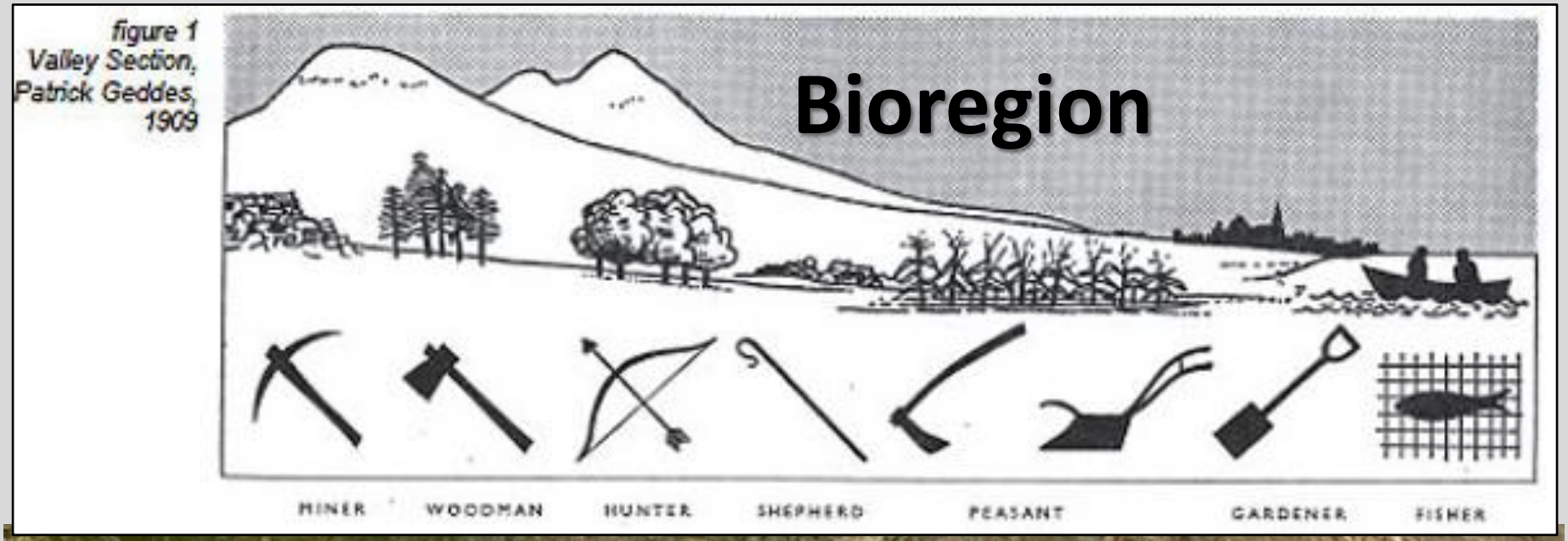
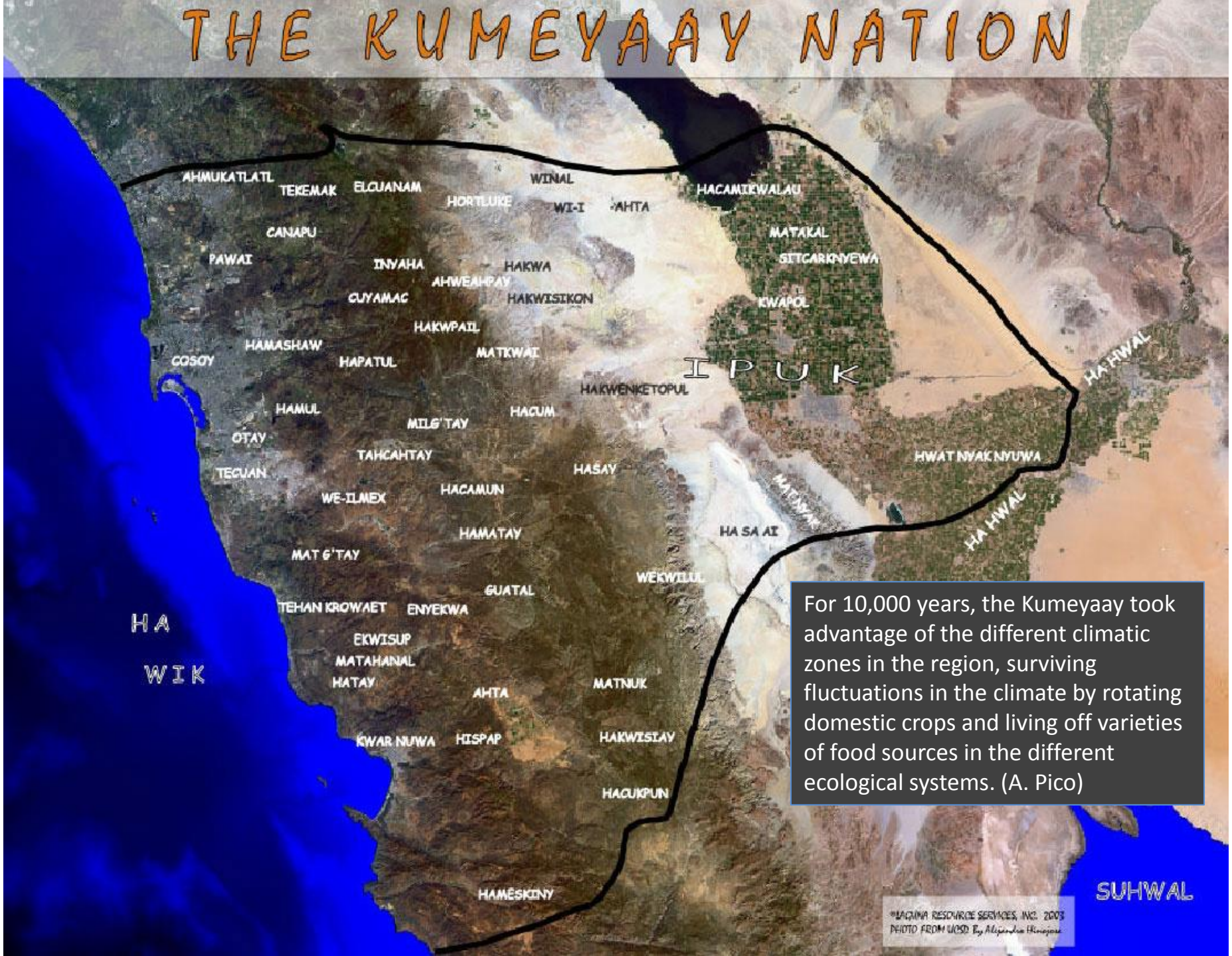


figure 1
Valley Section,
Patrick Geddes,
1909
MINER
WOODMAN
HUNTER
SHEPHERD
PEASANT
GARDENER
FISHER

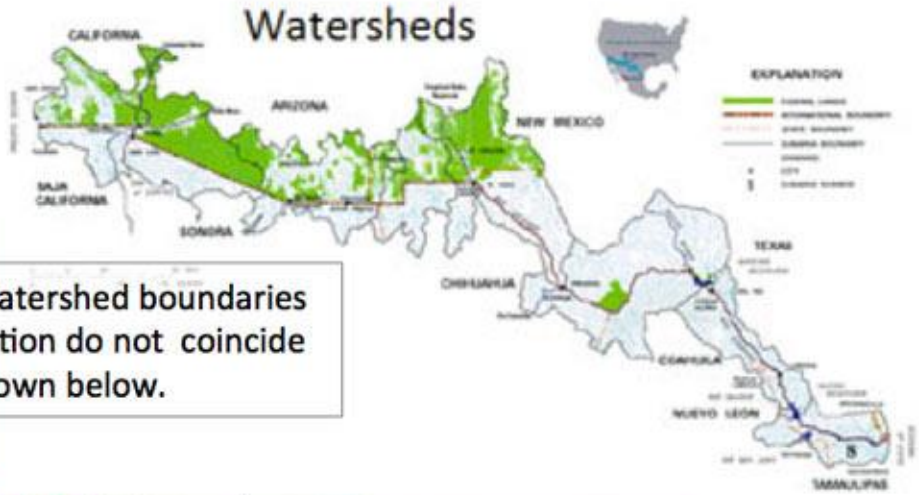
THE KUMEYAAY NATION



For 10,000 years, the Kumeyaay took advantage of the different climatic zones in the region, surviving fluctuations in the climate by rotating domestic crops and living off varieties of food sources in the different ecological systems. (A. Pico)


USGS
science for a changing world
GNEB
Environmental Advisors Across Borders
Good Neighbor Environmental Board
California
Arizona
Texas
Baja California
Sonora
Chihuahua
Coahuila
Nuevo Leon
1
2
3
4
5
6
7
8
Ecological regions
of the U.S.-Mexico border
Border Evironmental Health Initiative Regions
California Coastal Sage, Chaparral, and Oak Woodlands
Chihuahuan Desert
Mandrean Archipelago
Sonoran Desert
Southern Texas Plains/ Interior Plains and Hills with Xerophytic Shrub and Oak Forest
Western Gulf Coastal Plain
0 60 120 240 360 480
Miles

Watersheds and Political Jurisdictions Along the U.S.-Mexico Border

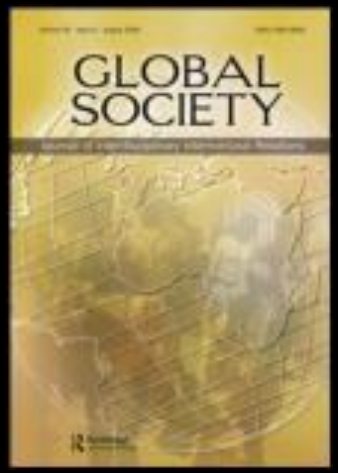


*Note how the transboundary watershed boundaries shown in the upper right illustration do not coincide with the political jurisdictions shown below.

CA
AZ
NM
TX
BC
SON
CHIH
COAH
NL
TAMPS

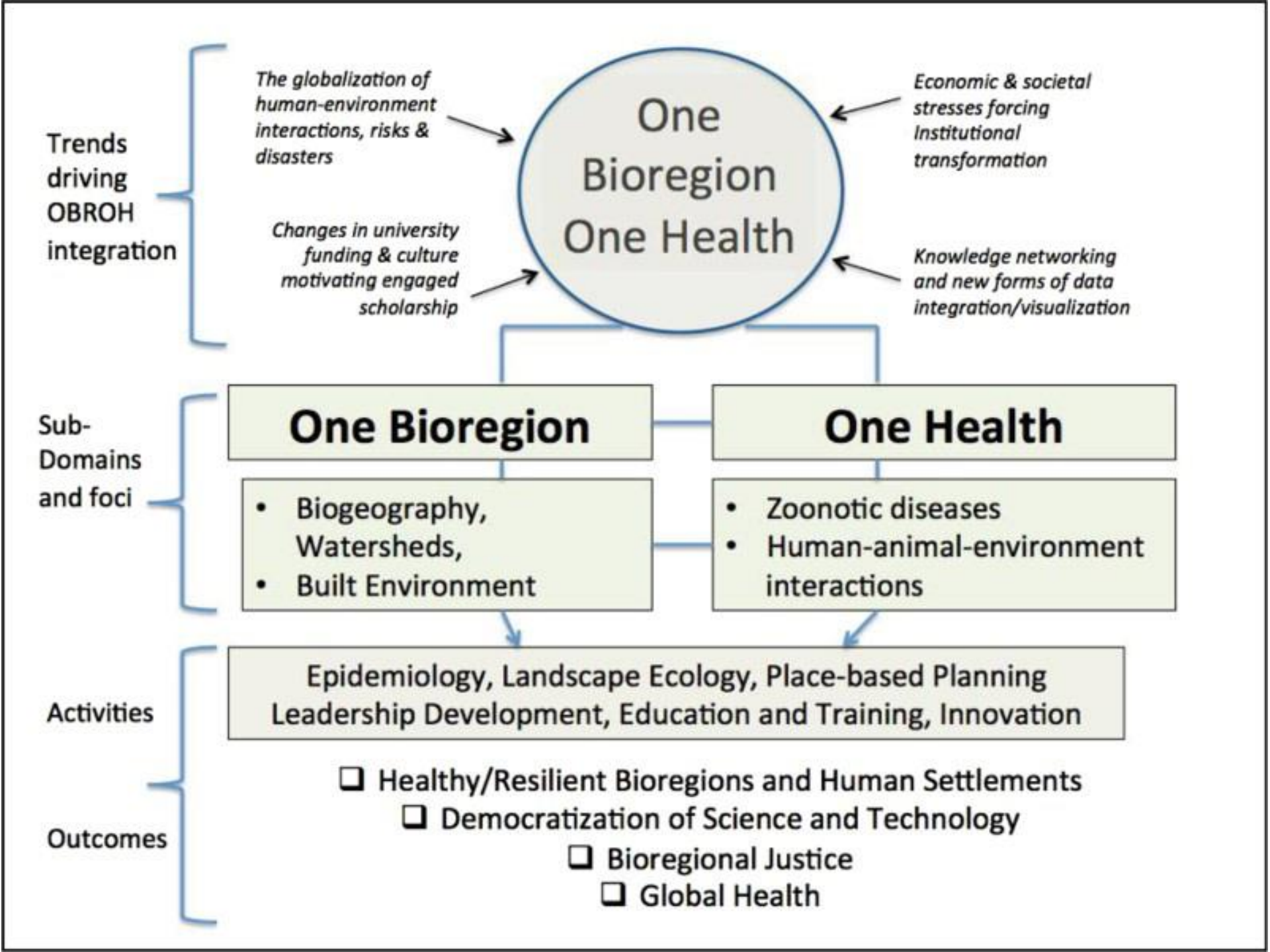
San Diego
Imperial
Yuma
Pima
Santa Cruz
Cochise
Hidalgo
Do
Luna
El Paso
Culberson
Presidio
Brewster
Terrel
Valverde
Kinney
Maverick
Dimmit
Webb
Zapata
Starr
Hidalgo
Cameron
Tijuana
Tecate
Mexicali
San Luis Rio Colorado
Puerto Peñasco
Plutarco Elías Calles
Caborca
Altar
Saric
Nogales
Santa Cruz
Cananea
Naco
Janos
Agua Prieta
Ascención
Juárez
Pragedis Guerrero
Guadalupe
Ojinaga
Ocampo
Acuña
Jimenez
Piedras Negras
Guerrero
Hidalgo
Anahuac
Nuevo Laredo
Guerrero
Mier
Miguel Aleman
Camargo
G. Diaz Ordaz
Reynosa
Rio Bravo
Valle Hermoso
Matamoros

The US-Mexico border region is shared by 2 nations, 10 states (4 in the US and 6 in Mexico), and 64 municipalities (39 in Mexico and 29 in the US). There are also 26 US federally recognized Native American tribes.



Bioregional Science

One Bioregion/One Health: An Integrative Narrative for Community Engagement and Research Translation


Trends driving OBROH integration
The globalization of human-environment interactions, risks & disasters
Economic & societal stresses forcing Institutional transformation
One Bioregion One Health
Changes in university funding & culture motivating engaged scholarship
Knowledge networking and new forms of data integration/visualization
Sub-Domains and foci
One Bioregion
One Health
• Biogeography, Watersheds,
• Built Environment
• Zoonotic diseases
• Human-animal-environment interactions
Activities
Epidemiology, Landscape Ecology, Place-based Planning
Leadership Development, Education and Training, Innovation
Outcomes
❑ Healthy/Resilient Bioregions and Human Settlements
❑ Democratization of Science and Technology
❑ Bioregional Justice
❑ Global Health

SB 535 Disadvantaged Communities in San Diego:

Disproportionately affected by pollution and suffering from high concentrations of unemployment, low levels of homeownership, high rent burden, and low levels of educational attainment.

SB 535 :Cap-and-trade revenues should be leveraged to bring jobs and investment to communities hit hardest by pollution and to alleviate the impacts of climate change in those neighborhoods.

Mozilla Firefox

http://maxim.uc.../lotsurvey.htm

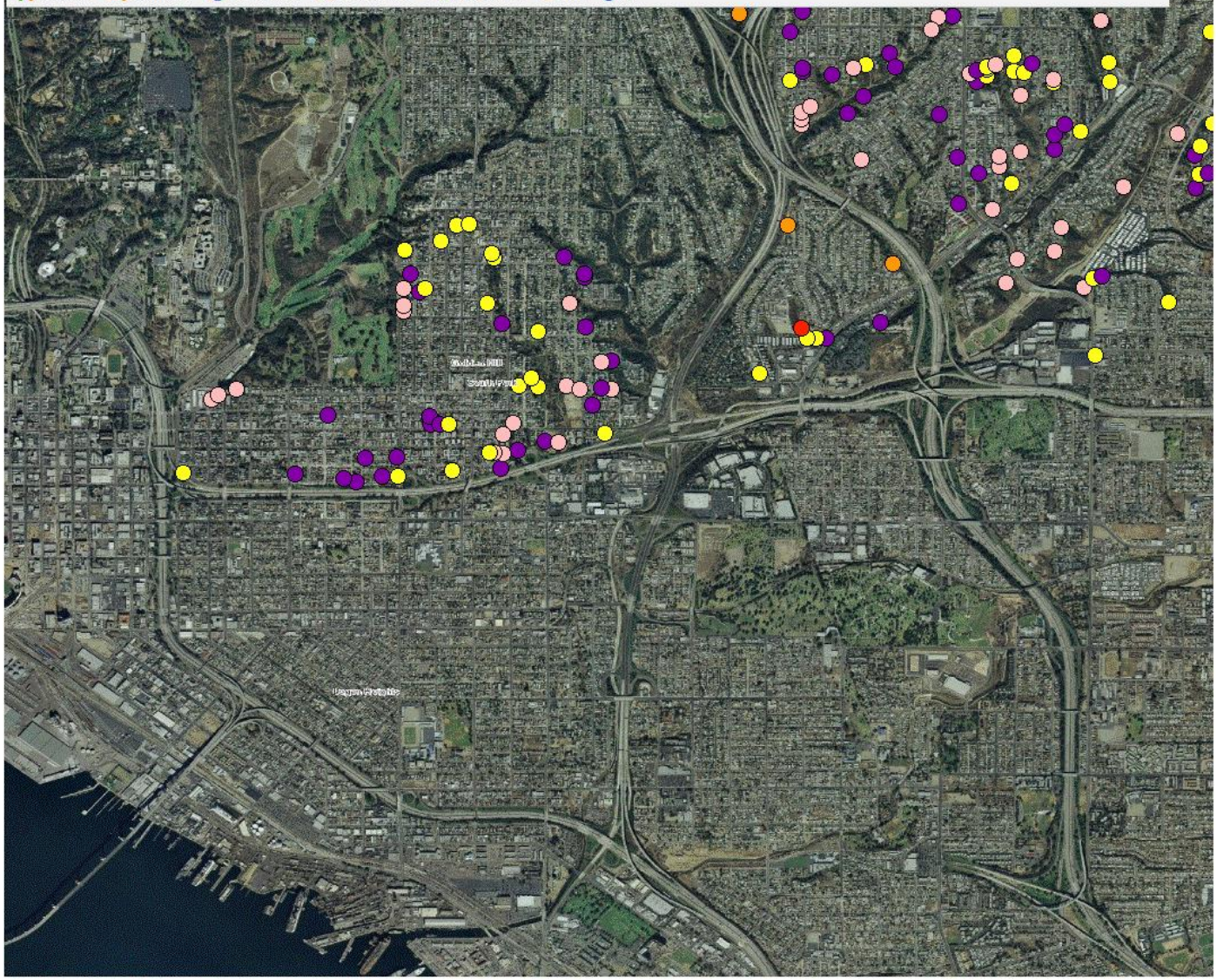
maxim.ucsd.edu/wiip/lotsurvey.htm

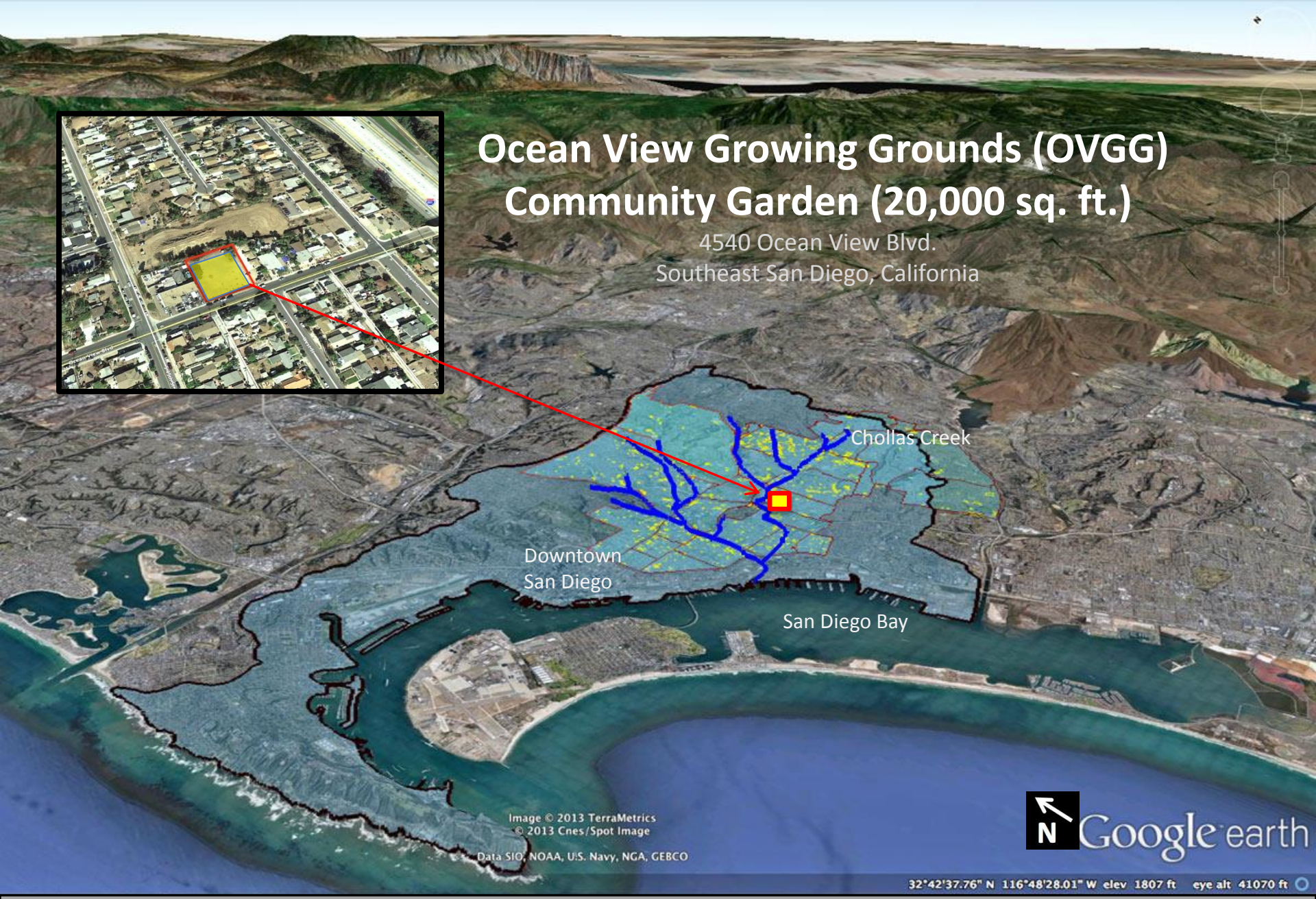
San Diego Vacant Lot Survey

Info | Charts | Mapping

27th and F st		
Lot size	0.28 Acres	Fair
Owner	Private	
Topography	Very steep and downhill	Poor
Sunlight	Has trees on side of lot and it is near the freeway	Good
Soil	There are lots of weeds, but some growth. The hill is covered with green	Fair
Electricity	Electrical line right over it.	Fair
Visibility	undefined	Good
Maintenance	No vandalism, but there's weeds.	Good
Fencing	One public fence on a side, 2 wooden house fences, open and facing 27th st.	Fair
Vehicle Access	Not a lot of parking and hard to turn around for trucks since it's a small road - okay for cars, but it's at the end of a street.	Poor
Parking	There is street parking, but people may have trouble with big events because it is limited.	Fair
Overall Rating	Fair	

Zoom In | Zoom Out | Full Extent | Prev Extent | Next Extent | Pan | ID





Map: Pueblo watershed (blue-grey polygon) within which sits the neighborhoods of Southeast San Diego, City Heights, Golden Hill and Mid-City Eastern (light blue polygons). These neighborhoods contain 810 vacant lots (shown as yellow polygons), one of which is the lot being transformed into the OVGG community garden and food forests. Chollas Creek is show as a blue lines.

Ocean View Growing Grounds Neighborhood

- SB 535 “disadvantaged communities” : disproportionately affected by pollution
- Latino – African American community of approximately 60,000 people
- Median income of less than $21,000.
- 38% live below the federal poverty level.
- 52% of the families with children under five live in poverty.
- 27%-34% of the children in the area are obese; Classified as a food desert;

OCEAN VIEW GROWING GROUNDS

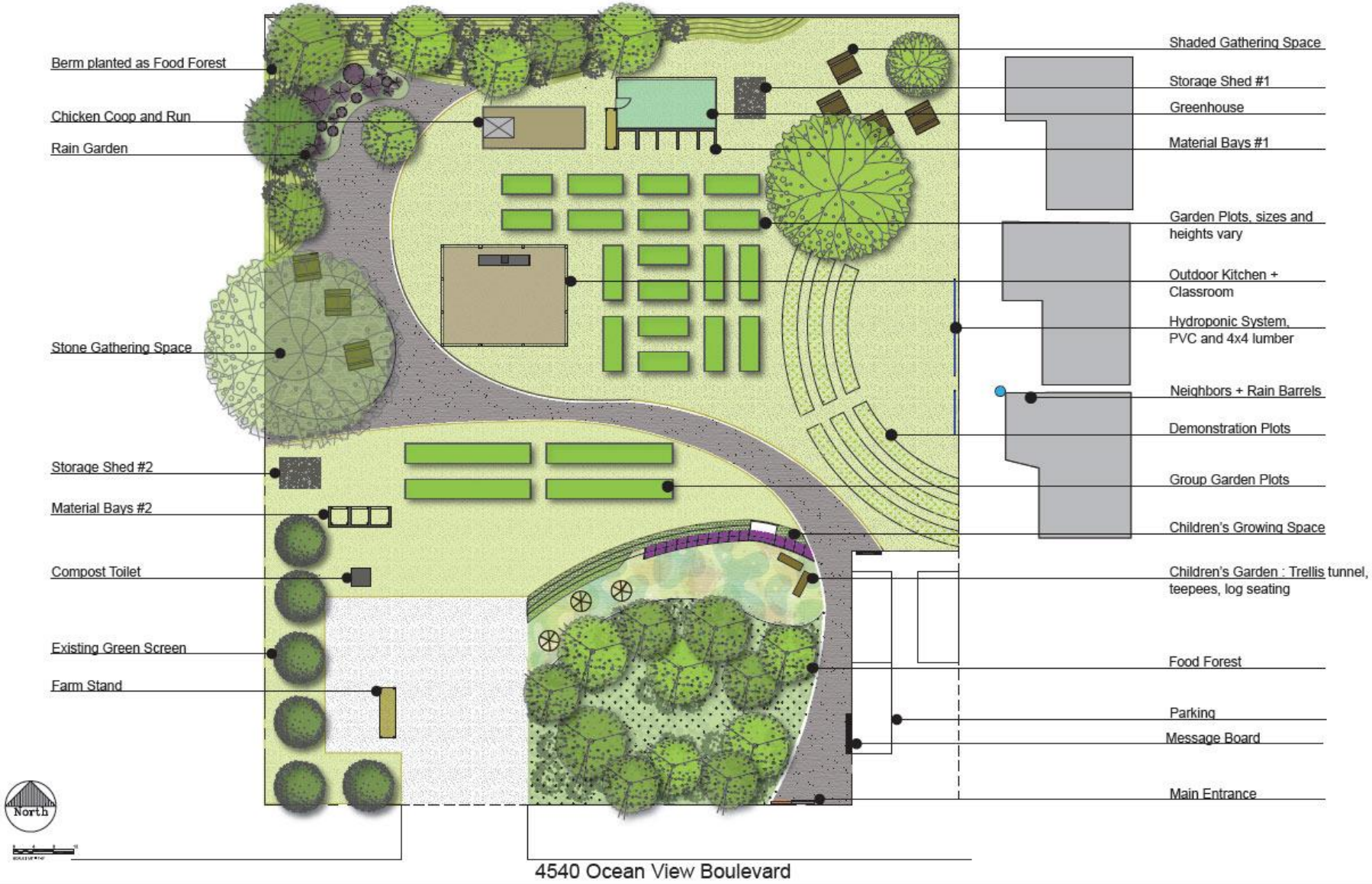
Urban Agriculture and Food Disparities: Eliminating Superfund toxicants at the food-water nexus in disadvantaged neighborhoods

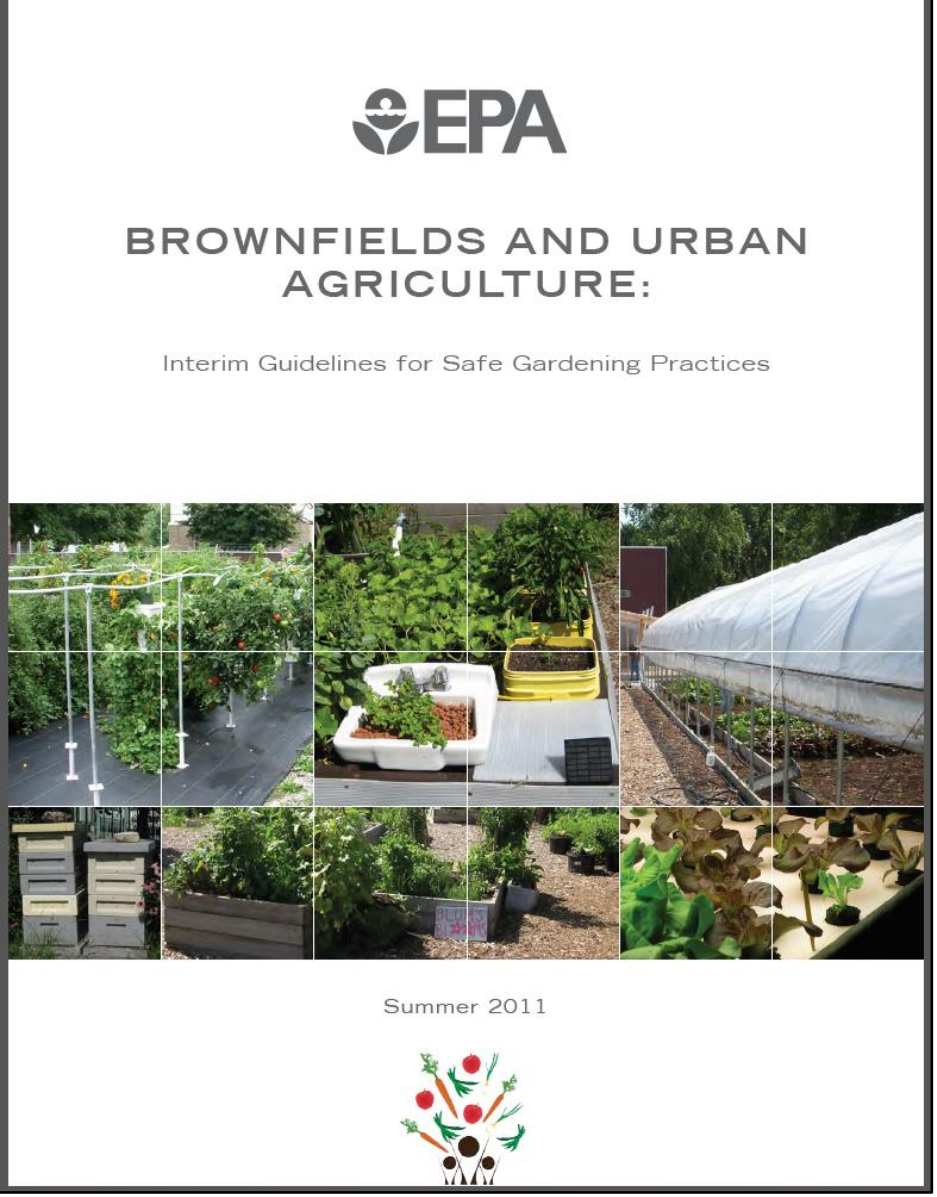
Growing community through food

a neighborhood garden — www.OVGG.org — contact ovgrowinggrounds@gmail.com

Photos: Ocean View Growing Grounds (top image). Ground Breaking Event (left image), Visioning Session led by The Global ARC, and Food Forest Workshop (two right images)

Ocean View Growing Grounds





U.S. EPA's Urban Agriculture website at:
http://www.epa.gov/brownfields/urbanag

Brownfield site contaminants

- Petroleum and other hydrocarbons
- Lead and other metals
- Polycyclic Aromatic Hydrocarbons (PAH)
- Volatile Organic Compounds (VOC)
- Polychlorinated Biphenyls (PCB)
- Controlled substances (meth labs)

What is missing?

- **Soil, plant and water testing capacity**
- **Science re contaminant exposure routes,**
- **Science re bioavailability of toxicants and plant uptake.**
- **Lack of clear cleanup standards and stability of land tenure**

Phase I Environmental Site Assessment

Ocean View Property
4540 Ocean View Boulevard
San Diego, California

Prepared for:

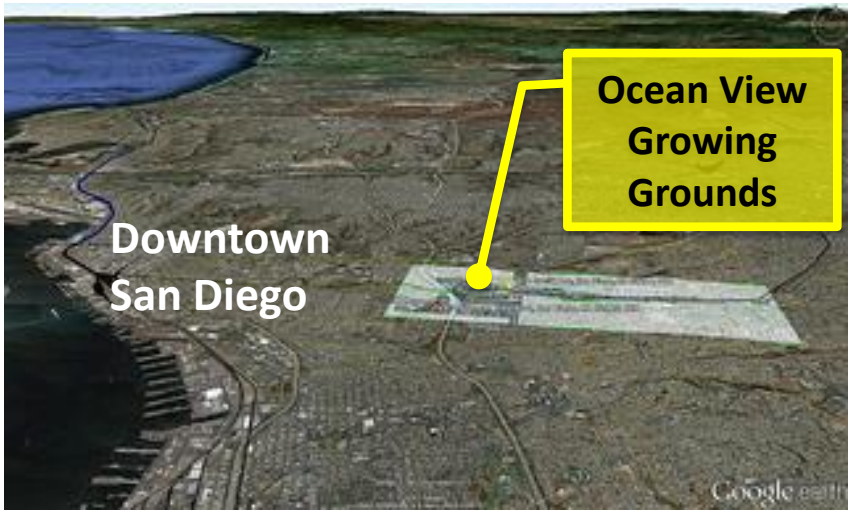
University of California, San Diego
Superfund Research Center
Community Engagement Core
Research Translation Core

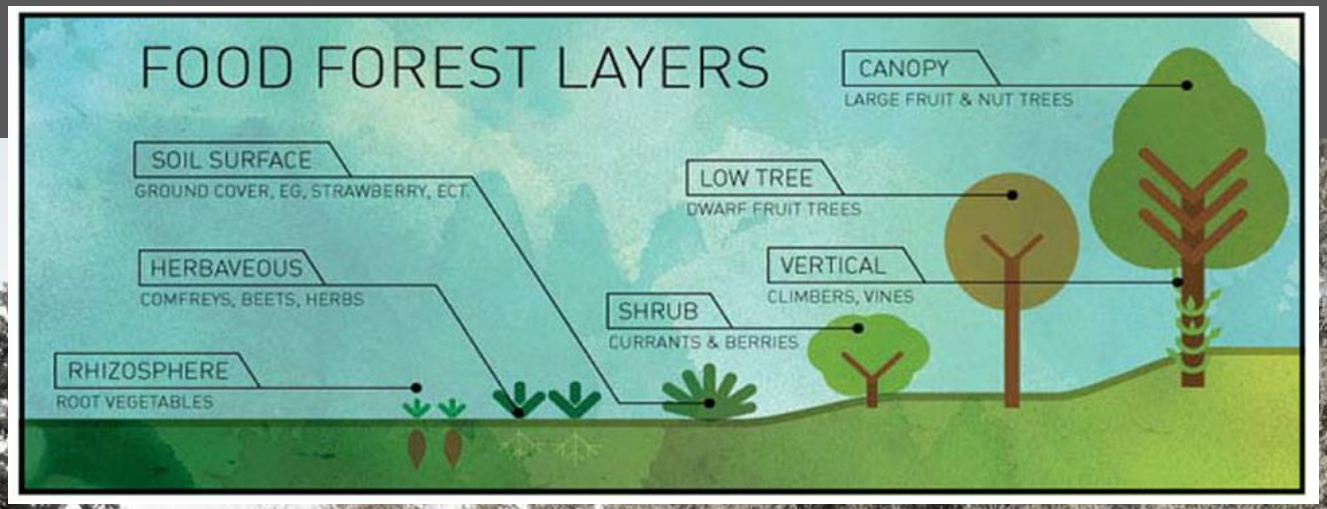
rincon

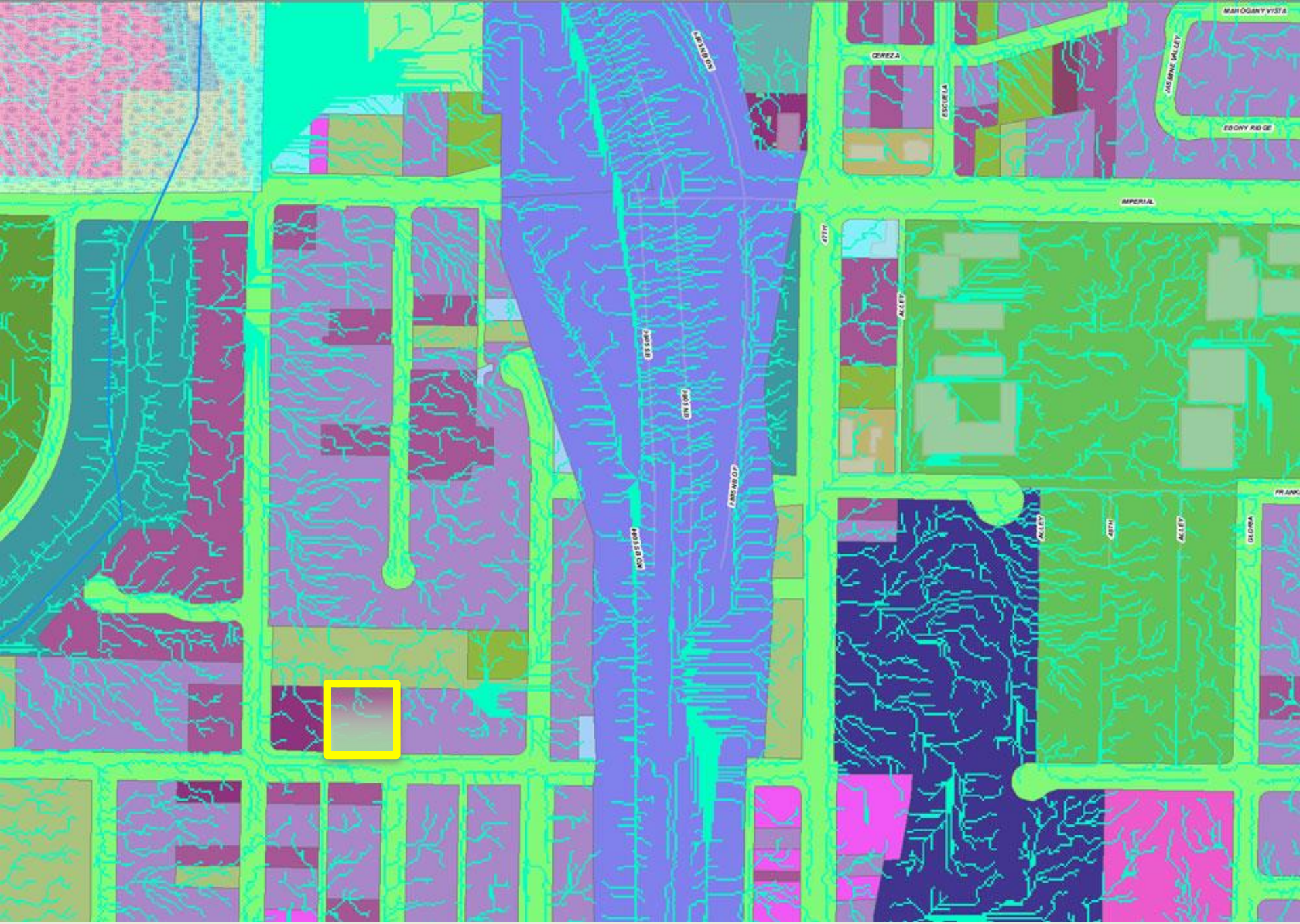
Prepared by:

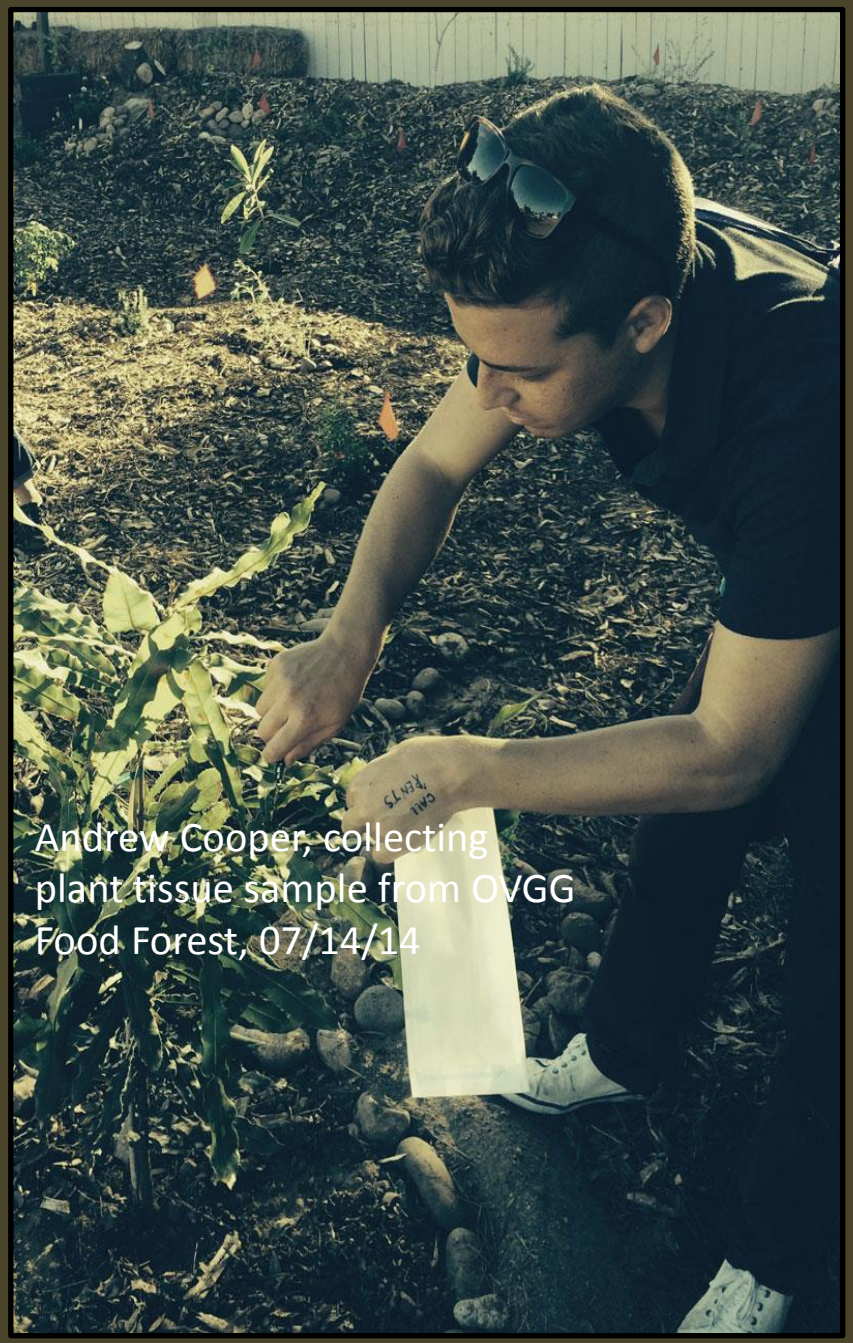
Rincon Consultants, Inc.
November 8, 2013

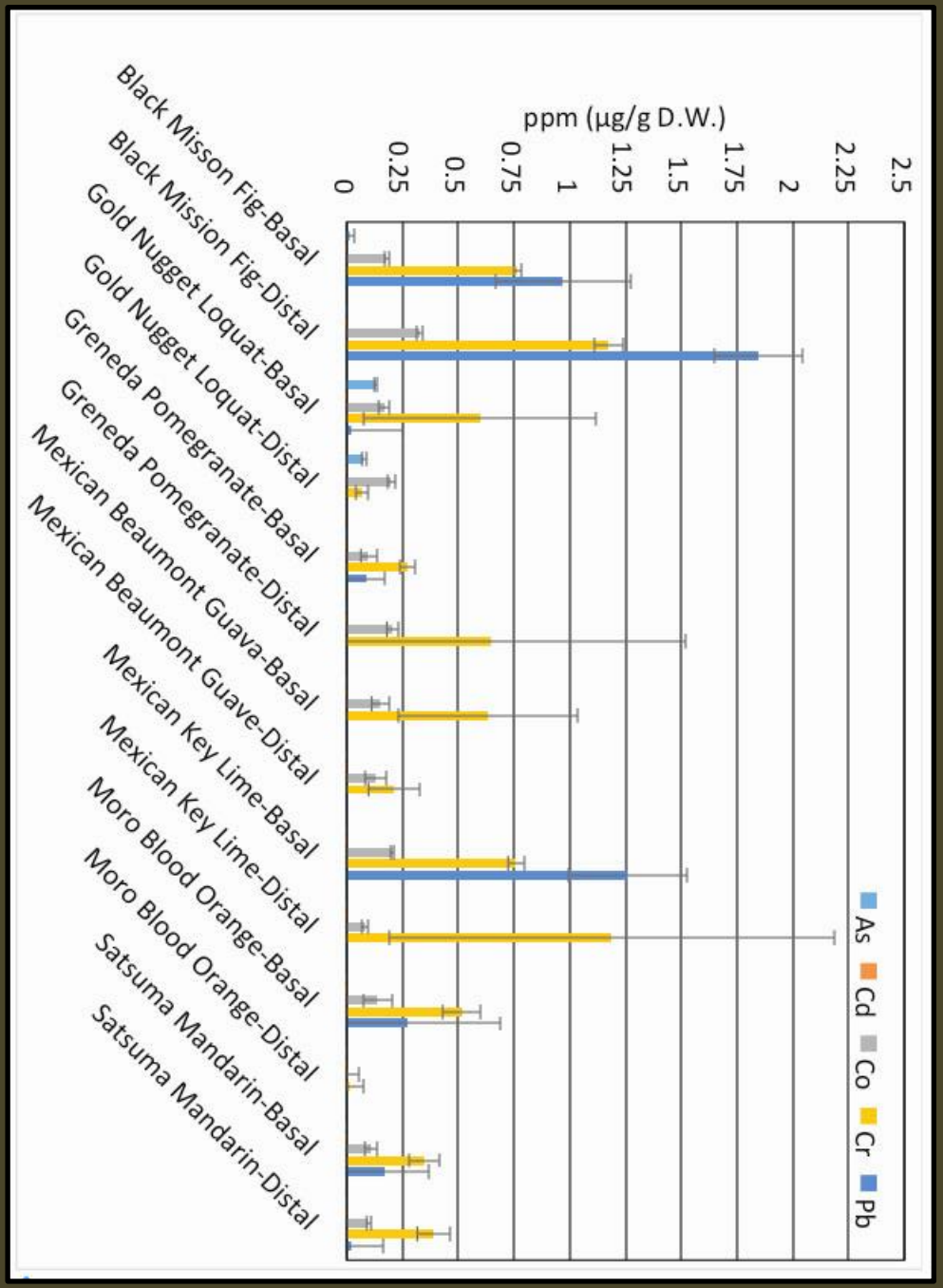
Environmental Scientists Planners Engineers

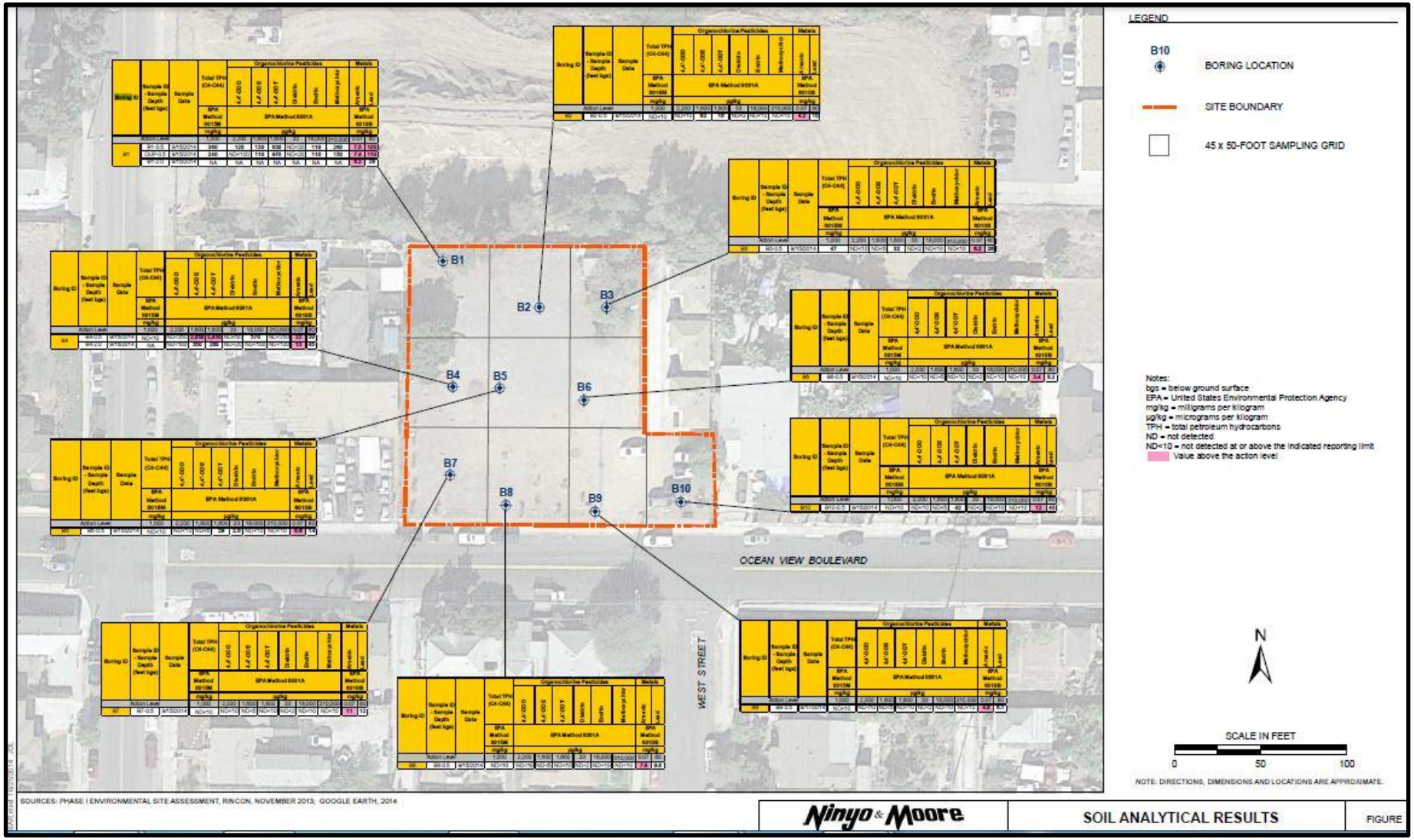



FOOD FOREST LAYERS
CANOPY
LARGE FRUIT & NUT TREES
SOIL SURFACE
GROUND COVER, EG, STRAWBERRY, ECT.
LOW TREE
DWARF FRUIT TREES
HERBAVEOUS
COMFREYS, BEETS, HERBS
VERTICAL
CLIMBERS, VINES
SHRUB
CURRANTS & BERRIES
RHIZOSPHERE
ROOT VEGETABLES


MAHOGANY VISTA
CEREZA
ESCUELA
JASMINE VALLEY
EBONY RIDGE
IMPERIAL
40TH
ALLEY
GLORIA


Andrew Cooper, collecting
plant tissue sample from OVGG
Food Forest, 07/14/14

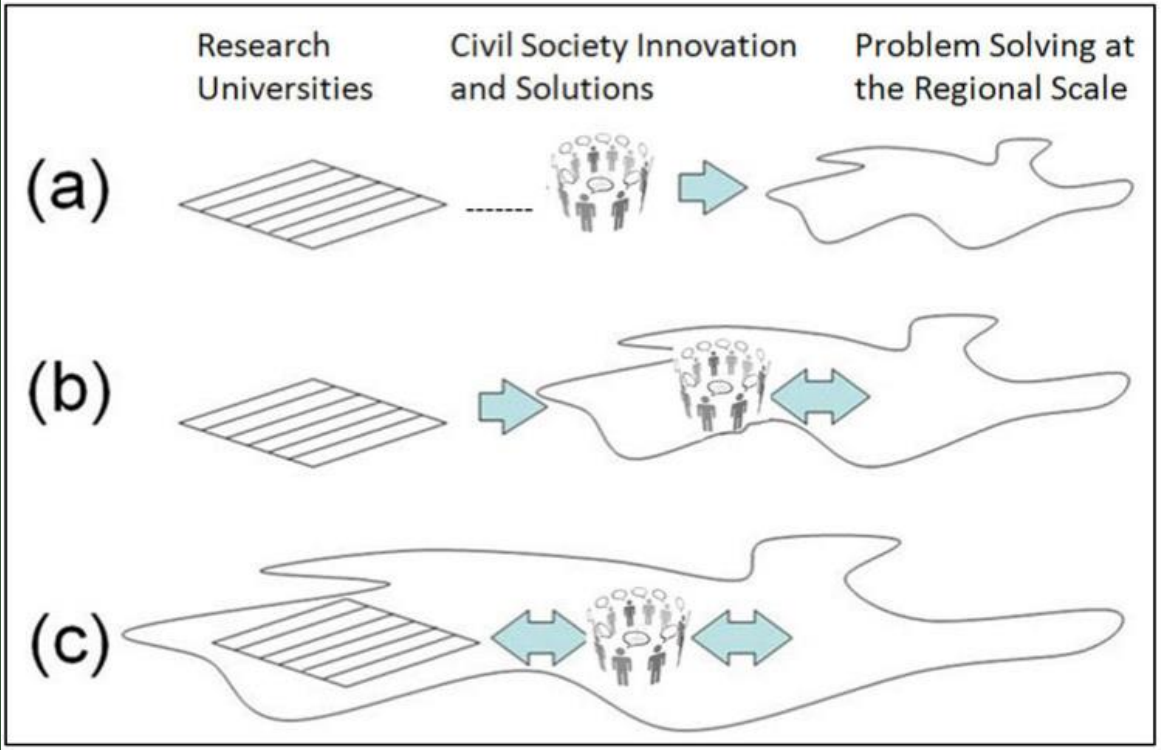

As
Cd
Co
Cr
Pb
ppm (µg/g D.W.)
2.5
2.25
2
1.75
1.5
1.25
1
0.75
0.5
0.25
0
Black Misson Fig-Basal
Black Mission Fig-Distal
Gold Nugget Loquat-Basal
Gold Nugget Loquat-Distal
Greneda Pomegranate-Basal
Greneda Pomegranate-Distal
Mexican Beaumont Guava-Basal
Mexican Beaumont Guave-Distal
Mexican Key Lime-Basal
Mexican Key Lime-Distal
Moro Blood Orange-Basal
Moro Blood Orange-Distal
Satsuma Mandarin-Basal
Satsuma Mandarin-Distal



Arsenic (22 mg/kg) and Lead (120 mg/kg) Detected Above Action Levels

- How are the soil's organic and inorganic contaminants changing over time?
- Are the plants grown on the site safe for human consumption?
- How do hydrological flows impact water quality?
- What is the potential for rainwater/gray water harvesting and water quality improvement through site and soil restoration?
- What is the presence of animals (e.g., worms, other small living organisms) in the food forest areas designed as stormwater bioretention spaces?

Bioregionalization of Survival and The Rooted University



- **Bioregional concepts like foodshed and watershed** have an increasingly vital role to play in how we frame environmental public health, hazardous substance risk assessment and ecological restoration.

- **Bioregional strategies** -including urban agriculture and community gardens—are beginning to link concerns about cancer, soil/water contamination, obesity, health and land use. This provides a fertile terrain for community engagement and research translation.