Integrating Mitigation, Carbon Sequestration and Ecosystem Services at Community-relevant Scales

Steve Kohlmann, PhD, Point Richmond, CA
Mark Mondik, Vice President, San Francisco, CA
Urban Transportation projects

- Small, linear footprint
- Disadvantaged Communities disproportionally affected
- Few endangered species, many common species

-> Regional Advance Mitigation

2050: 67% of world population is urban
Framework

WHAT: The integration of habitat mitigation with ecosystem services

WHERE: In the context of the ecological, economic and community “landscape”

HOW: A business model, market opportunities

Stakeholder Involvement (bottom-up)

Systems Thinking (urban ecosystem)

Public-Private Partnerships (market opportunities)
Criteria:
1. Establish ecosystem service targets that can be quantified and monetized
2. Recognize multiple ecosystem services and their role in climate change adaptation
3. Provide a comprehensive ecosystem context for urban mitigation
4. Appropriate scale of assessing and mitigating impacts
5. Maintains the ability for off-site mitigation
6. Encourages participation of stakeholders in local decision-making
7. Respects the neighborhood-specific cultural/socioeconomic context
8. Recognizes market opportunities beyond traditional mitigation/conservation banking
9. Builds partnerships between municipal, State, and private groups
Assembly Bill 32 - California Global Warming Solutions Act of 2006
  • Cap-and-Trade program
  • Funds must further reduce emissions of greenhouse gases

Senate Bill 535 of 2012 - Disadvantaged Communities:
25% of the Cap-and-Trade funds must be invested in:
  • Disadvantaged communities
  • Public health, quality of life and economic opportunity
Coarse Filter Analysis (whole ecosystem)

- Wetlands
- Streams
- Infiltration
- Ground-water

- Habitat
- Species
- Vegetation
- Carbon Stocks

- Public Health
- Poverty
- Transit
- Farms
- Last mile

Ecosystem

- Watersheds
- Topography
- Soils
- Connectivity

Human

- Neighborhood
- Disadvantaged
- C. Diversity

Ecological functions

- Climate
- Carbon
- Water & Food

Fine Filter Analysis (local assets)

Natural Capital

- ecosystem goods or services to benefit residents

Social Capital

- unique cultural and ethnic stakeholder perspectives

Human networks

- Education
- Culture
- Recreation
- Economic assets
- Individuals and their “gifts”
Ecosystem Services

- Hydrology
- Ecosystem Services
- Greenways
- Tree cover
- Protected areas
- Carbon Sequestration
- Species Impacts
- Hydrology
- Greenways
Community “Landscapes”

- Disadvantaged Communities
- Heat Stress
- Cultural Diversity
- Park Access & Schools
- Pollution
- Impacts
- LSA
- 3Degrees
Prioritization and Constraints

Prioritization of neighborhoods
- ranking system based on socioeconomic and disadvantaged community status.
- poorest communities receive a priority in addressing environmental impact mitigation.

Constraints Analysis
- Physical constraints
- Regulatory constraints
- Fiscal constraints
- Local issues, concerns, and cultural value considerations
“Community Ecosystem Service Banks”

- Habitat / OpenSpace / Carbon sequestration at the Neighborhood scale
- Debits and credits are addressed by the community in its own cultural context
- Credits belong to local communities
- Pride of Ownership, Sense of Belonging, Motivation, Health
- Intergenerational learning, applied science curriculum, local food, arts
Financing: Voluntary Carbon Offsets

Voluntary Carbon Offset Supply & Demand, 2008-17

Prices Range from $.50/tCO2e to $50.0/tCO2e (average=$3/tCO2e)

Source: Ecosystems Marketplace, April 2018
Business Model: Many Interested Stakeholders with Complementary Program Funds

States & Cities (CA 2018: $8B)
- GHG emission reduction programs and Climate adaptation grants (Forest health, Soil Health, Urban Forestry)
- Water Bonds ($13 B in 2018)
- Transportation Plans (Measure M)

Corporations and non-profits
- Healthcare organizations
- Job creation, community engagement

Voluntary corporate actors
- Carbon credits
- Water credits (emerging)

Utilities/Energy
- Urban forestry
- Agricultural offsets under Windfarms

Mitigation or compensatory payments
- Regulatory Mitigation of new development impacts (species, habitat)
- Santa Barbara County – Air quality mitigation for oil exploration GHG – agricultural carbon sequestration

→ Most of these funding sources are complementary (no direct overlap) and can be used simultaneously to fund the same project activity
• Provides funding of $30-40M/year in U.S. alone
• Primarily large U.S. companies seeking to neutralize GHG emissions relevant to their activity
• Strong interest in local GHG reduction projects with strong “co-benefits”
• BUT carbon offsets only convey GHG benefits (other benefits remain available)
• Very few urban-sited offset projects but strong demand for them

Greenhouse gas emissions aspiration: Become climate-neutral in our operations by 2020.

Google Environmental Report 2018

“Google has been carbon neutral for more than a decade, and in that time, we’ve partnered with more than 40 carbon offset projects to offset more than 17 million tCO₂e”