

Economics and Alluvial Fans

Alluvial Fan Task Force
Plenary Meeting 4
March 14, 2008

Presentation by:

Dr. W. Bowman (Bo) Cutter, Ph.D.

Autumn DeWoody

Economics/Water Resource Management

University of California Riverside

(951) 787-2088

Bowman.Cutter@ucr.edu

**Technical Consultant to the
Alluvial Fan Task Force**



What Key Services Do Alluvial Fans Potentially Provide?

- | | |
|----------------------|--|
| Housing | <ul style="list-style-type: none">• Remaining open land, good views. |
| Open Space | <ul style="list-style-type: none">• Increases housing values.• Recreational values. |
| Ecological | <ul style="list-style-type: none">• Preservation of habitat and migration. |
| Flood Control | <ul style="list-style-type: none">• Safe areas for routing flood water. |
| Recharge | |
| Water Quality | <ul style="list-style-type: none">• Groundwater recharge.• Infiltration of runoff. |

Fans Can Be Important to Groundwater Recharge.

Mountain
Runoff

- Large area exposed hard rock.

Alluvial Soils

- Existing recharge of natural runoff.

- Opportunity for spreading imported or recycled water.

Groundwater Storage is Like a Savings Account.

Variable Flows



- *Storage, like savings, is more valuable with more uncertainty.*
- *Climate change, Delta issues add to uncertainty.*

Measuring Open Space Benefits

Residential real estate

Nearby open space increases value.

- Parks, wetlands, lakes, rivers, etc.

Recreation

- Value= time and expense dedicated to activity.

Open space values are found across many areas and studies.

Open Space Benefits Real Estate Benefits Are Often Large.

Living within 1500 ft
of natural area • + 16.1%

Living within 1500 ft
of urban park • + 1.8%

Wetlands:

Open water/seasonally
flooded • +2.6% (within 1 mile)

Forested wetland • -1.9 % (within 1 mile)

Real estate benefits depend on the type of open space.

Counting Natural Disaster Economic Impacts.

Losses All direct and indirect effects.

Costs Losses that are reimbursed.

Direct losses

- Cost of physical damage (to structures/people) from event.
- Will exceed the costs.

Indirect Losses

- Temporary unemployment and business disruption.
- Ex. Loss of recharge capacity.

Indirect losses likely to have a large impact on local economy because they are usually not reimbursed

Significant Direct Costs From Floods.

Flood damage
counting

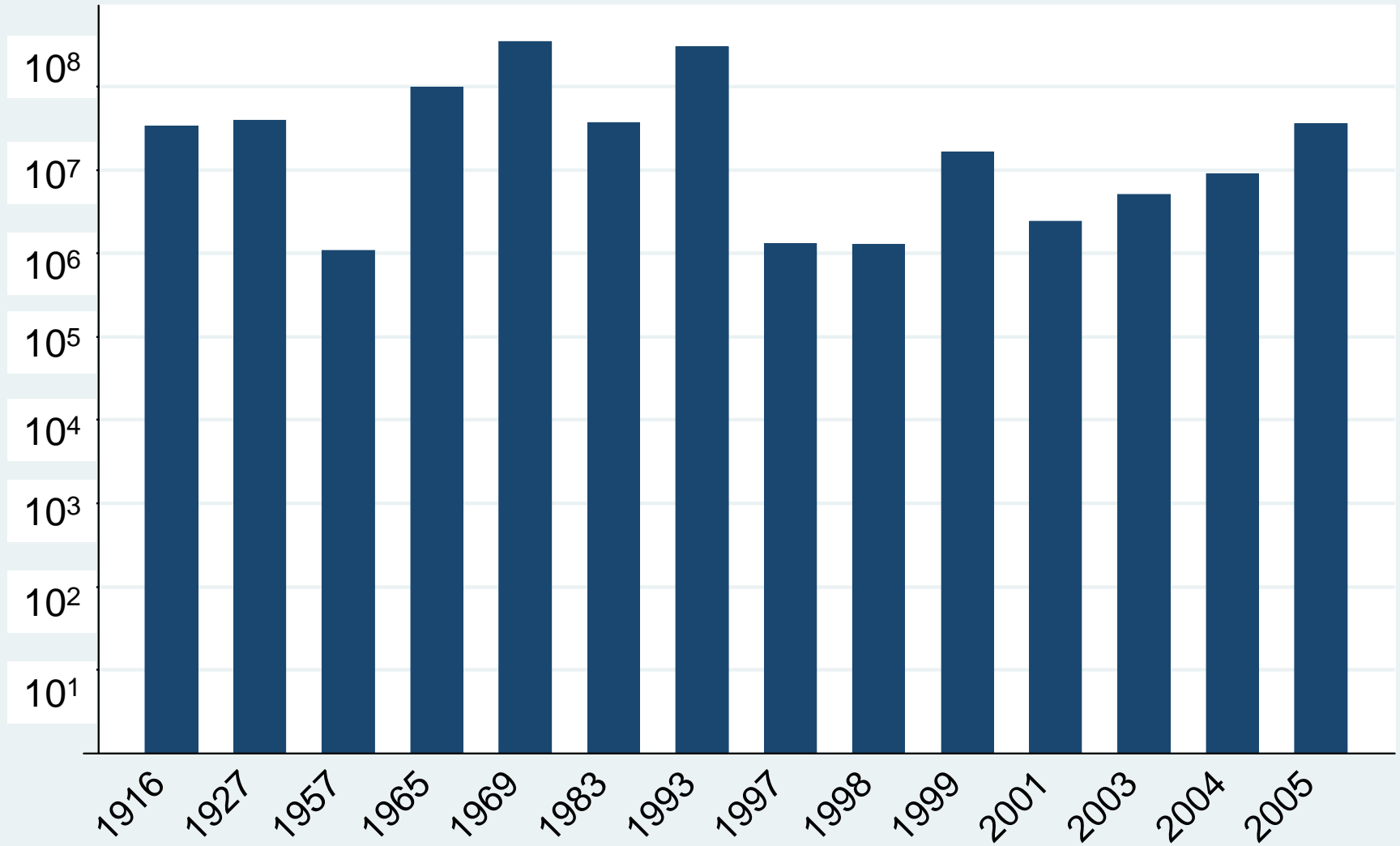
- Cannot separate out types and geographic area of floods.
- Property damages and debris removal costs.

San Bernardino
and Riverside
Counties
Report

- Greater than \$900 million cost.
- High proportion of fan flooding.
- Greater than \$1.3 billion for Southern California.

*Indirect costs of floods are not included
and are likely large.*

Historical Flood Direct Costs: San Bernardino and Riverside Counties.



2007 Dollars using ENR Construction Cost Index

Flood Control Revenues Limited.

Property taxes

- Capital, maintenance and operations.

State and Federal aid

- Volatile.
- Often restricted to capital costs.

Developer fees

- Developers pay portion of fees.
- Usually covers capital costs.

Maintenance costs of an increasing infrastructure stock are a key concern.

Property Taxes Have Risen Little Relative to Construction Costs.

San Bernardino and Riverside Property Tax Flood Control Revenues.



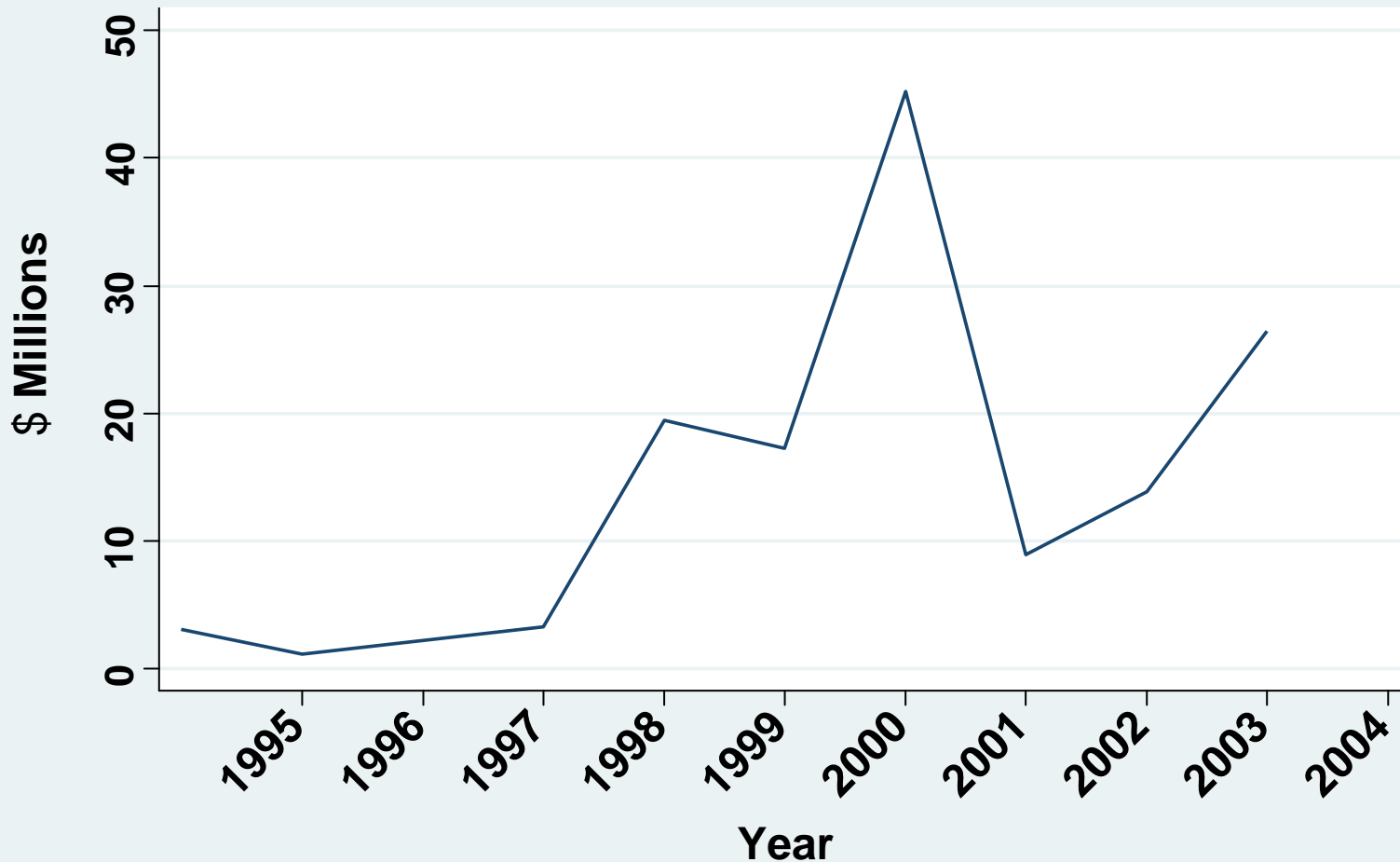
— San Bernardino
Property Tax

— Riverside
Property Tax

State and Federal Aid is Volatile.

San Bernardino County State/Federal Flood Control Revenue

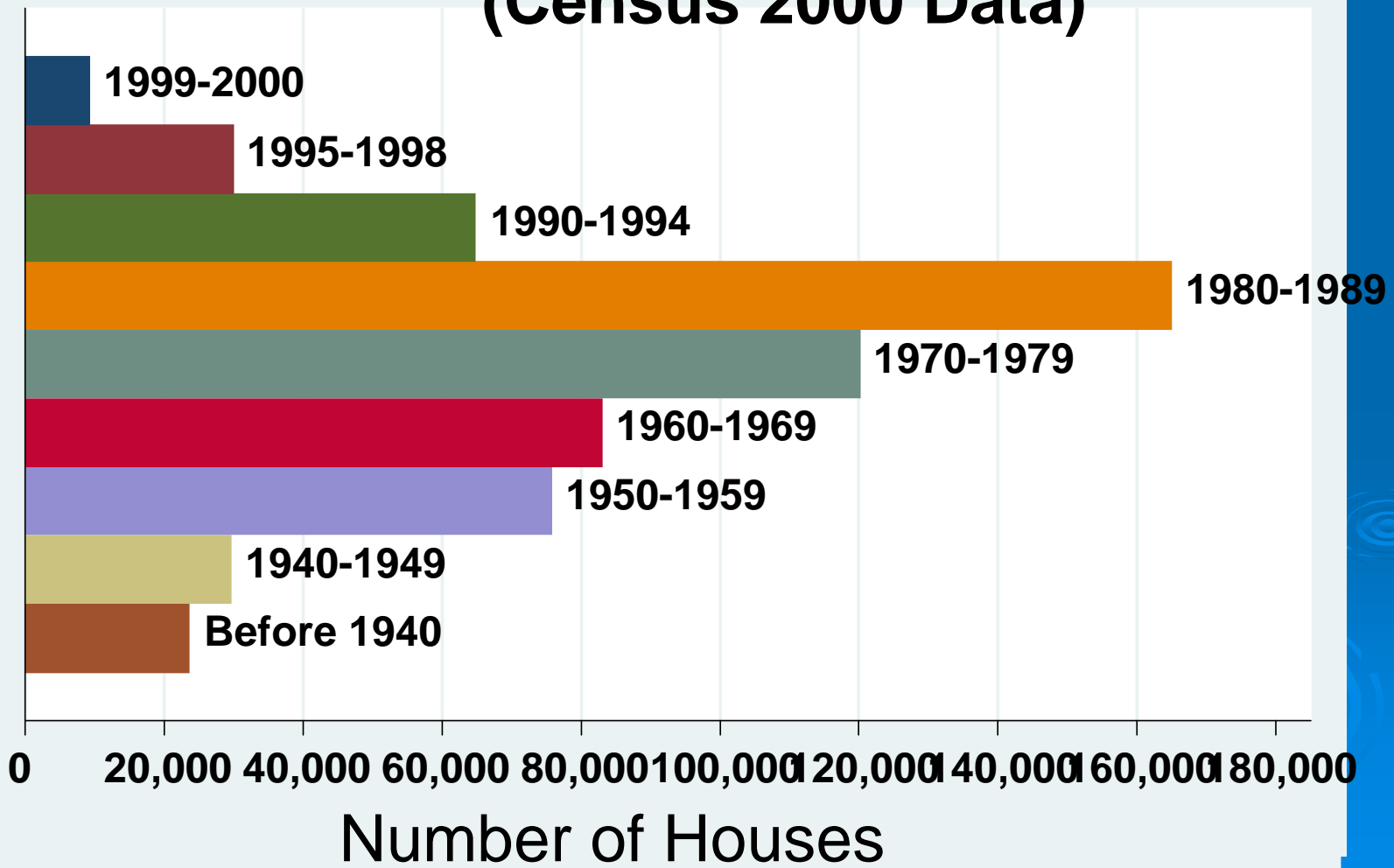
Adjusted for Construction Cost Price Index.



Maintenance Costs are Likely To Increase.

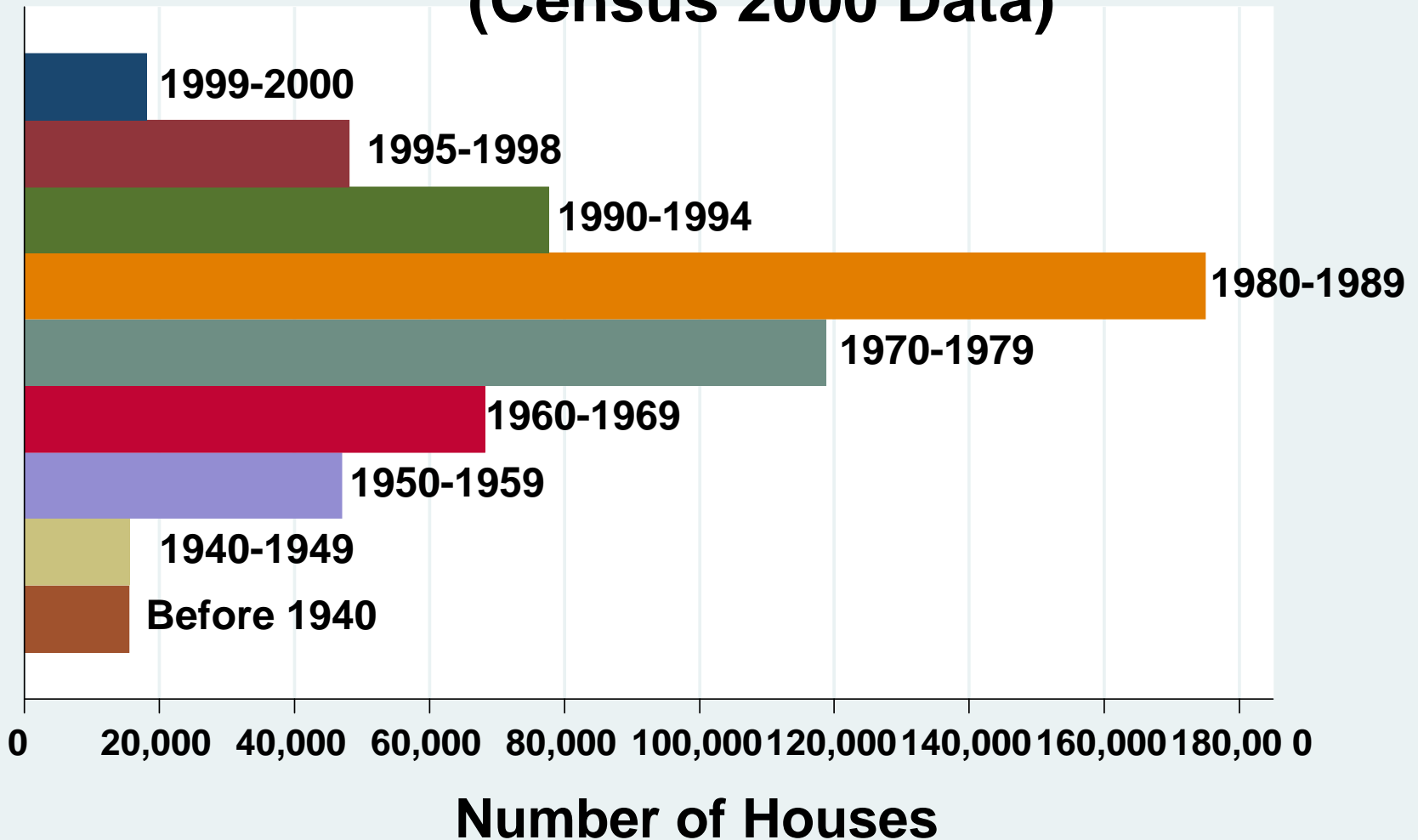
Number of Houses by Year Built – San Bernardino County

(Census 2000 Data)



Maintenance Costs are Likely To Increase.

Number of Houses by Year Built- Riverside County (Census 2000 Data)



Additional Funding Mechanisms.

Local alternatives

- Developers pay stormwater fee to support infrastructure.
- Assessment Districts, Mello-Roos, Geologic Hazard Abatement Districts (GHADs).

Stormwater bond

- \$500 million for Los Angeles Proposition “O.”

State funding

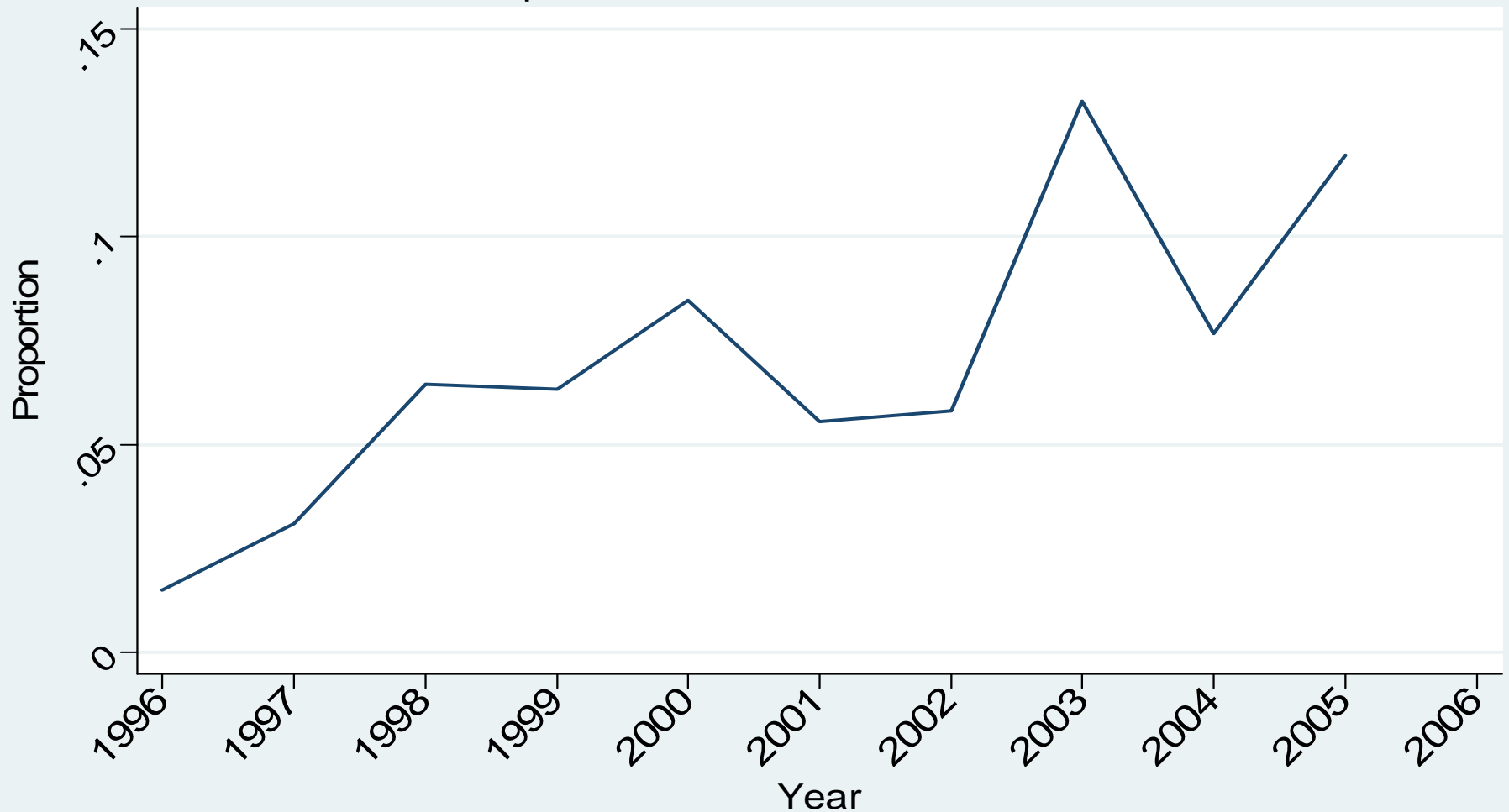
- Voter Approved Prop 1E funds.

Water supply agencies

- Investments in infiltration capacity.

Developer Fees Can Be A Significant Revenue Source.

Riverside County Area Drainage Fees.
Proportion of Flood Control Revenue.



Local Alternatives:

Similarities Across Funding Structures.

(Assessment Districts, GHADs, Mello-Roos.)

Funding	<ul style="list-style-type: none">• Dollar (not percentage) fee/tax.• Some cost of living increase built in.
Governance	City council or county supervisors.
Contracting	May contract with local agency for flood control services.
Formation	<ul style="list-style-type: none">• Best formed at time of development with single landowner.

Eligible Projects or Programs

**Assessment
District**

**Funding linked to property
benefits.**

Mello-Roos

**Special tax for properties
that benefit from community
facilities.**

GHAD

- **Properties that benefit from
geologic hazard mitigation.**
- **Erosion, flood control,
seismic, water quality.**

Legal Status.

GHAD

- **State agency.**
- **Exempt local ordinances.**
- **Can own property.**
- **Eminent domain.**

**Assessment/
Mello-Roos**

- **Fund raising mechanisms.**

Science or Engineering Requirements.

GHAD

“Plan of Control” certified by geologic engineer.

Assessment

Certification that assessment amount is related to benefits.

Mello-Roos

No science/engineering requirement.

Local Bond Funding: Los Angeles Proposition O.

Amount

• \$500 million.

Objectives

• Water quality, flood prevention, water conservation, open space.

Approval

2/3 approval needed.

Vote

• 75.8% Yes.

State Bond Funding: Proposition 1 E.

- \$300 million stormwater outside of Central Valley.
- \$290 million flood protection corridors: bypasses, setbacks.
- Could be used to set aside key flood channels and open space.

Funding and Vision Work Together.

Vision:

- Set aside flood channels, habitat, high infiltration areas.
- Flood control facilities.
- Maintenance funds.
- Recovery funds.

Additional Funding:

- Local bonds
- State bonds
- Water supply agencies
- Developer fees
- Local funding district.
- Local funding district

Takeaway.

1. Multiple benefits can be provided by alluvial fans.
2. Flood control agency funding alone will not support multiple benefits.
3. Local funding districts and developer fees can provide more funding at the local level.
4. Regional and state bonds can provide funding for capital costs.
5. Water supply agencies could provide funding to preserve or enhance infiltration and groundwater recharge.