



Stormwater Controls in New Development Projects

Understanding Numeric BMP Sizing Criteria

Presented by

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Presentation Objectives

- **Discuss advantages of uniform BMP design criteria – a.k.a. Numeric Sizing Criteria**
- **Identify areas where BMP design criteria have or will be implemented**
- **Review BMP design criteria in proposed Santa Clara Valley permit amendment**
- **Make sense of the proposed BMP design criteria**



Advantages of Uniform BMP Design Criteria

- Establishes a **basis for compliance**
- Provides a measure of **equity** in BMP implementation
- Allows for **consistent evaluation and improvement** of
 - Individual BMPs
 - Overall BMP program



CA Migration of BMP Design Criteria – In Place

- **Tahoe Basin**
- **SUSMPs**
 - Los Angeles County (Unincorporated)
 - Los Angeles County (Municipalities)
 - City of Long Beach
- **Ventura County County-wide Permit**
- **San Diego County-wide Permit**



CA Migration of BMP Design Criteria – Being Considered

- **Santa Clara Valley**
- **L.A. County (Round 2)**
- **And who knows where else?**
 - **Orange County Permit, San Diego Regional Board jurisdiction?**
 - **Others?**



Proposed Design Criteria Santa Clara Valley

- **Volumetric** design basis for
 - Detention, Wet and Dry
 - Retention
 - Infiltration
 - Wetlands
- **Flow** design basis for
 - Biofilters
 - Media filters
- **Some BMPs require consideration of both**
 - Diversion to off-line detention, retention, etc.



Proposed Design Criteria Santa Clara Valley

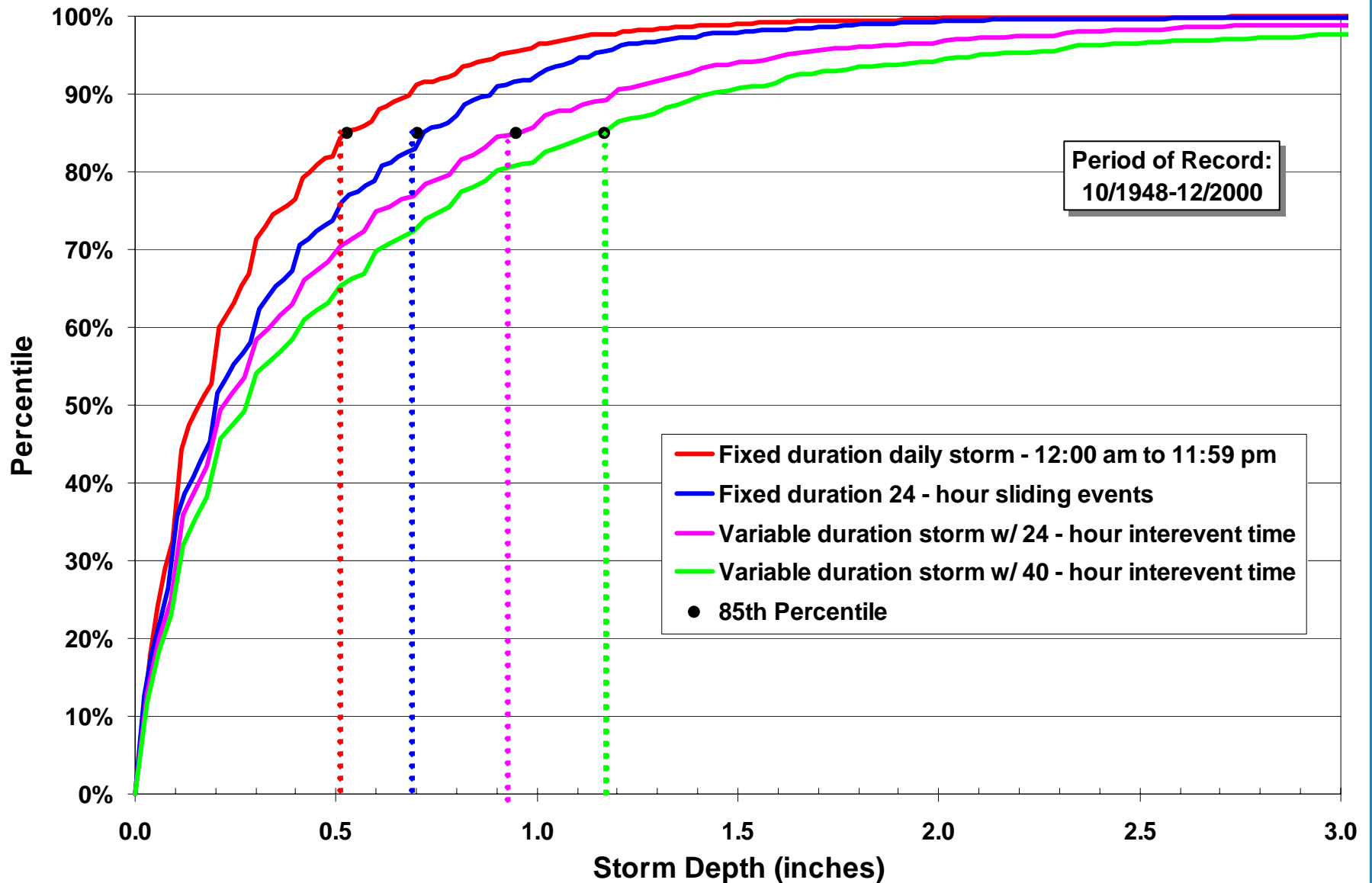
- **Volumetric Design Basis**
 - Each runoff event up to the 85th percentile 24-hour storm runoff event – **The URQM Approach**
 - Volume of annual runoff to achieve 80 percent capture – **The CA BMP Handbook Approach**



Volumetric Design Basis

- **Current language is ambiguous**
 - 24 hr storm Vs 24 hr runoff event?
 - Not part of URQM approach
 - Not recognized by Mother Nature
- **Language can be clarified, yielding a sound approach**
- **CA BMP Handbook Vs URQM**
 - Same underlying approach

San Jose NCDC Station (7821) - Santa Clara County, California
Cumulative Frequency Curves of Storm Depth for
Fixed-Duration and Variable-Duration Storm Events

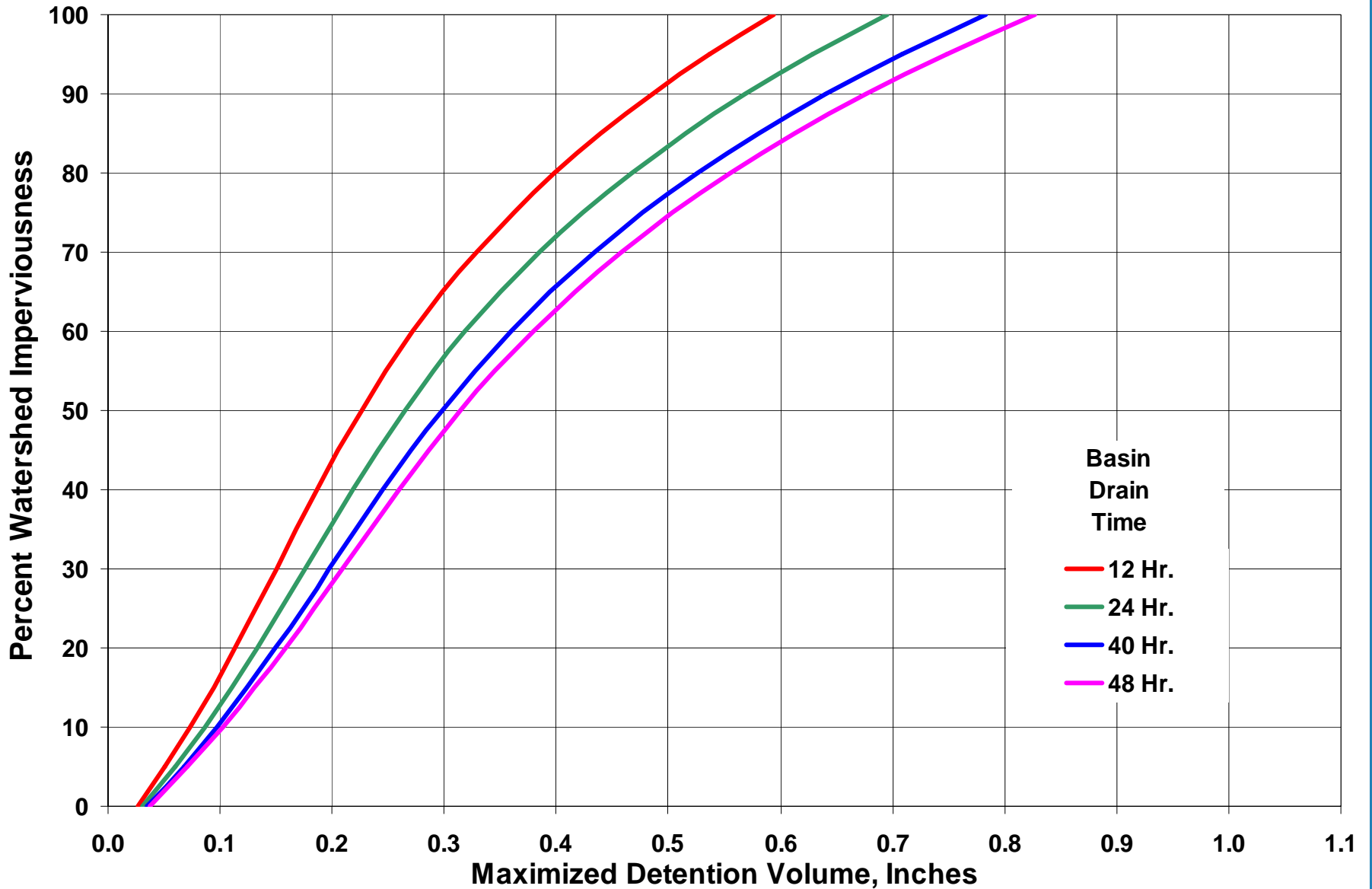




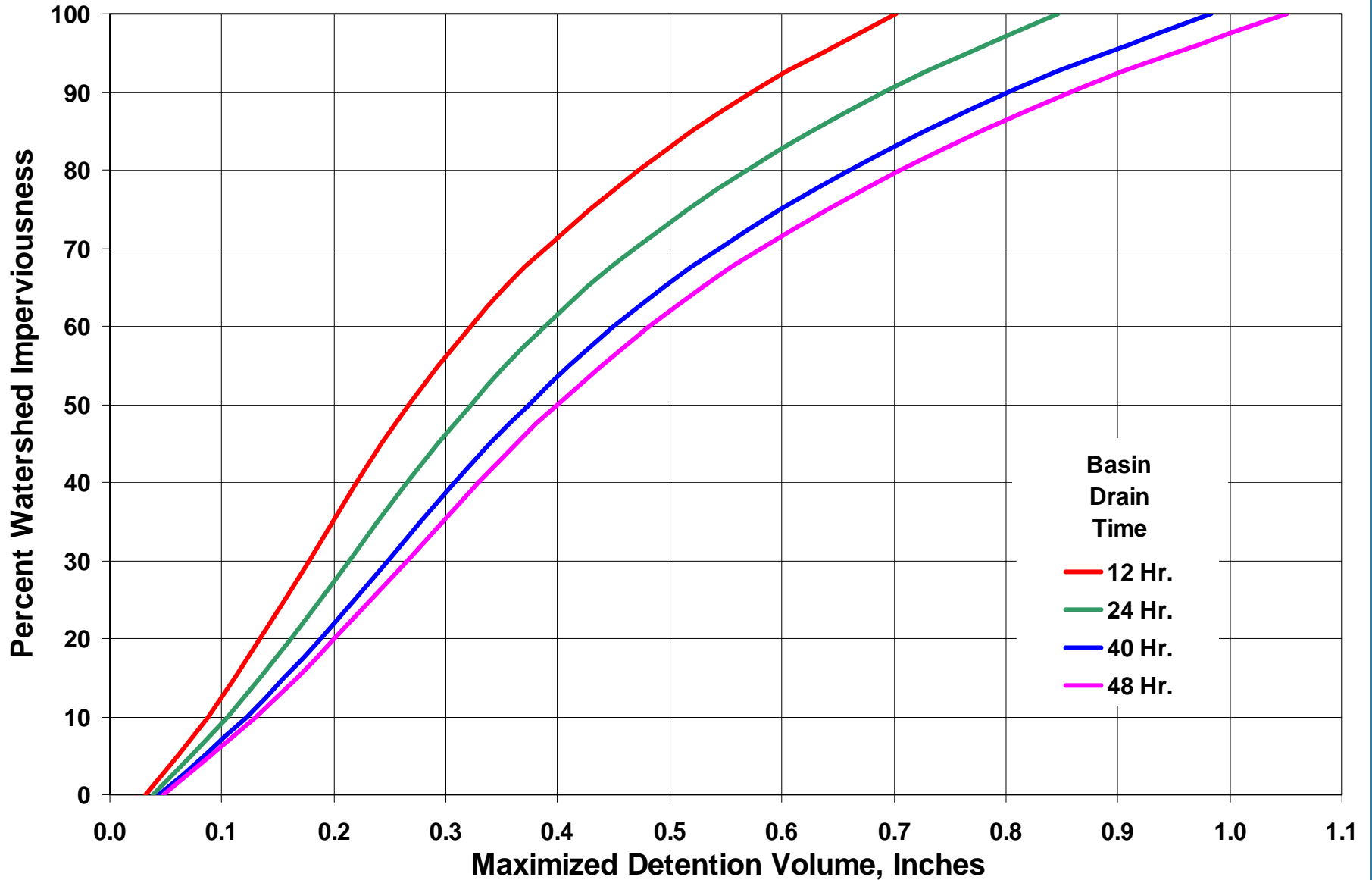
URQM Approach

- **Current language allows multiple interpretations**

URQM Maximized Detention Volume 85% Event Capture for San Jose, California

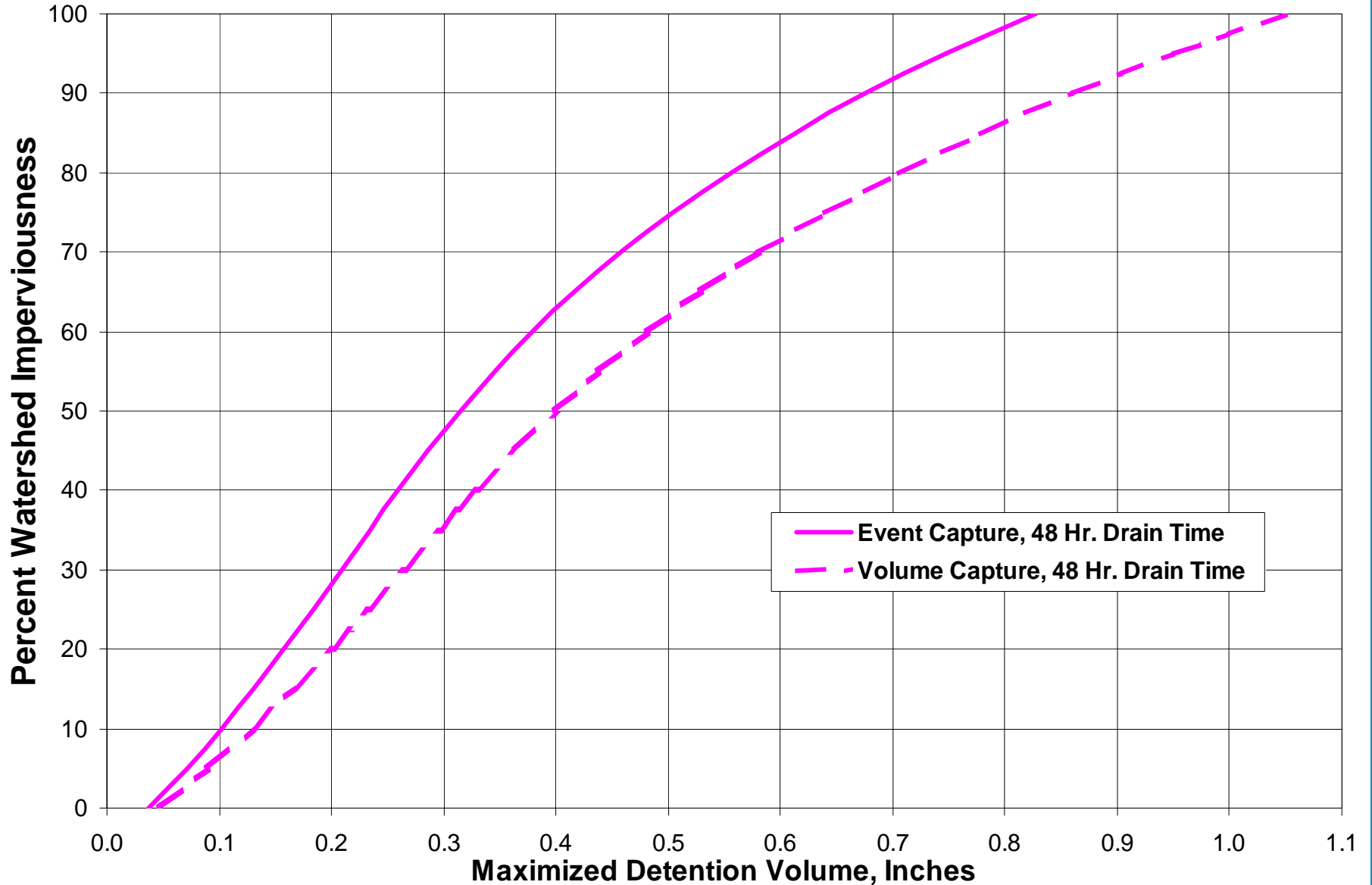


URQM Maximized Detention Volume 85% Volume Capture for San Jose, California



URQM Maximized Detention Volume

85% Event Capture vs Volume Capture for San Jose, California

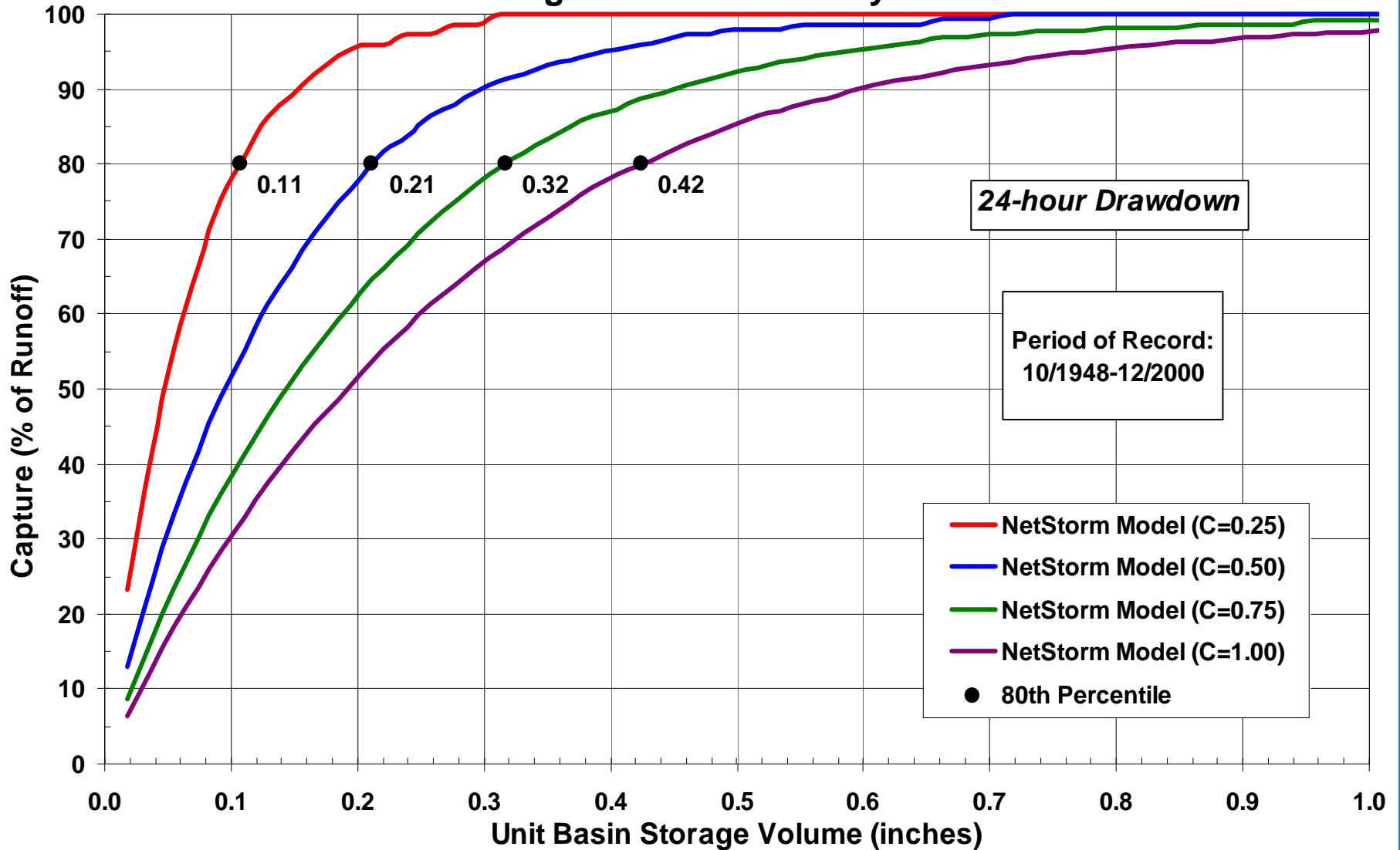




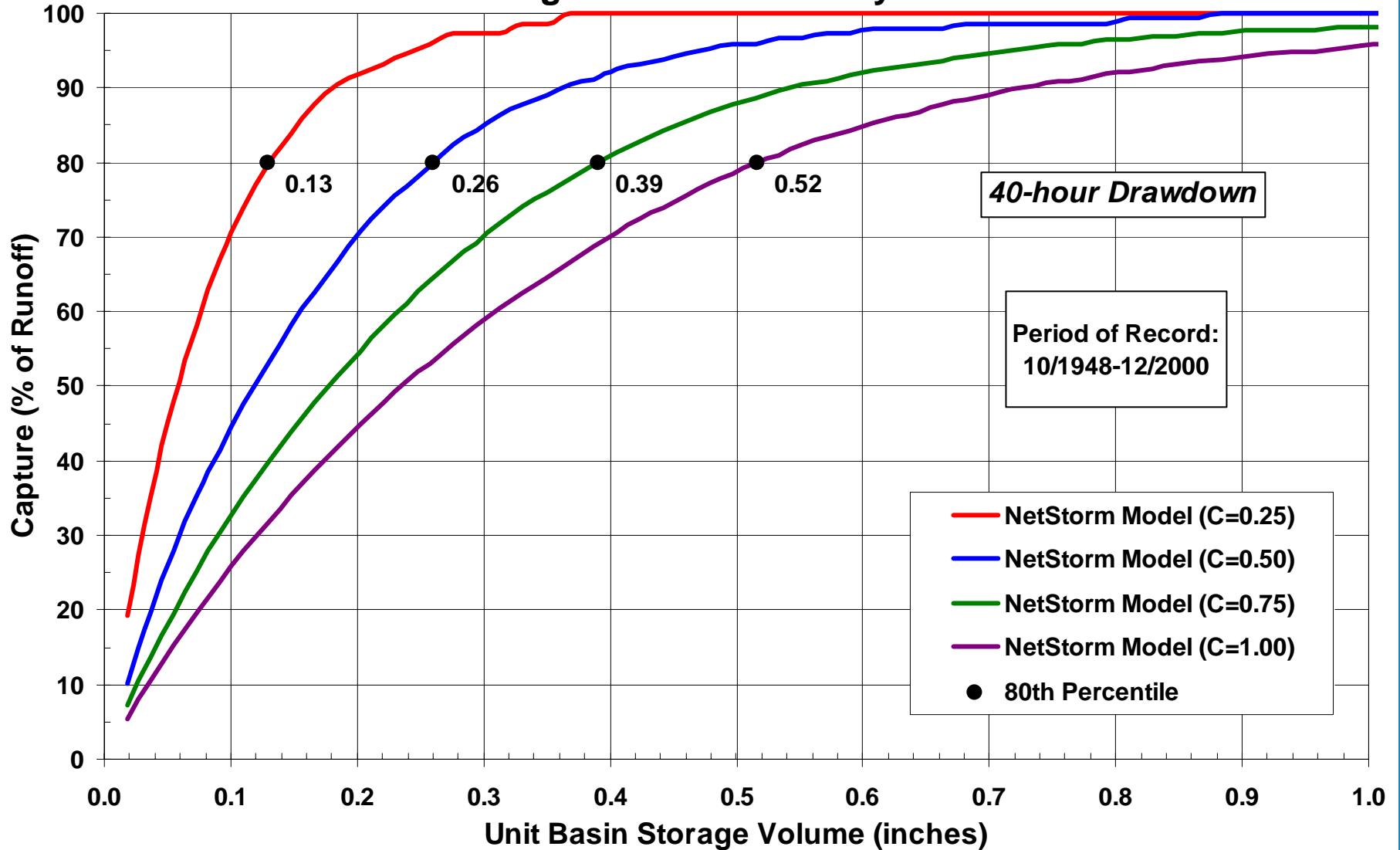
CA BMP Handbook Approach

- **Current language is sufficiently clear to implement**

San Jose NCDC Station (7821) - Santa Clara County, California Storage / Treatment Analysis



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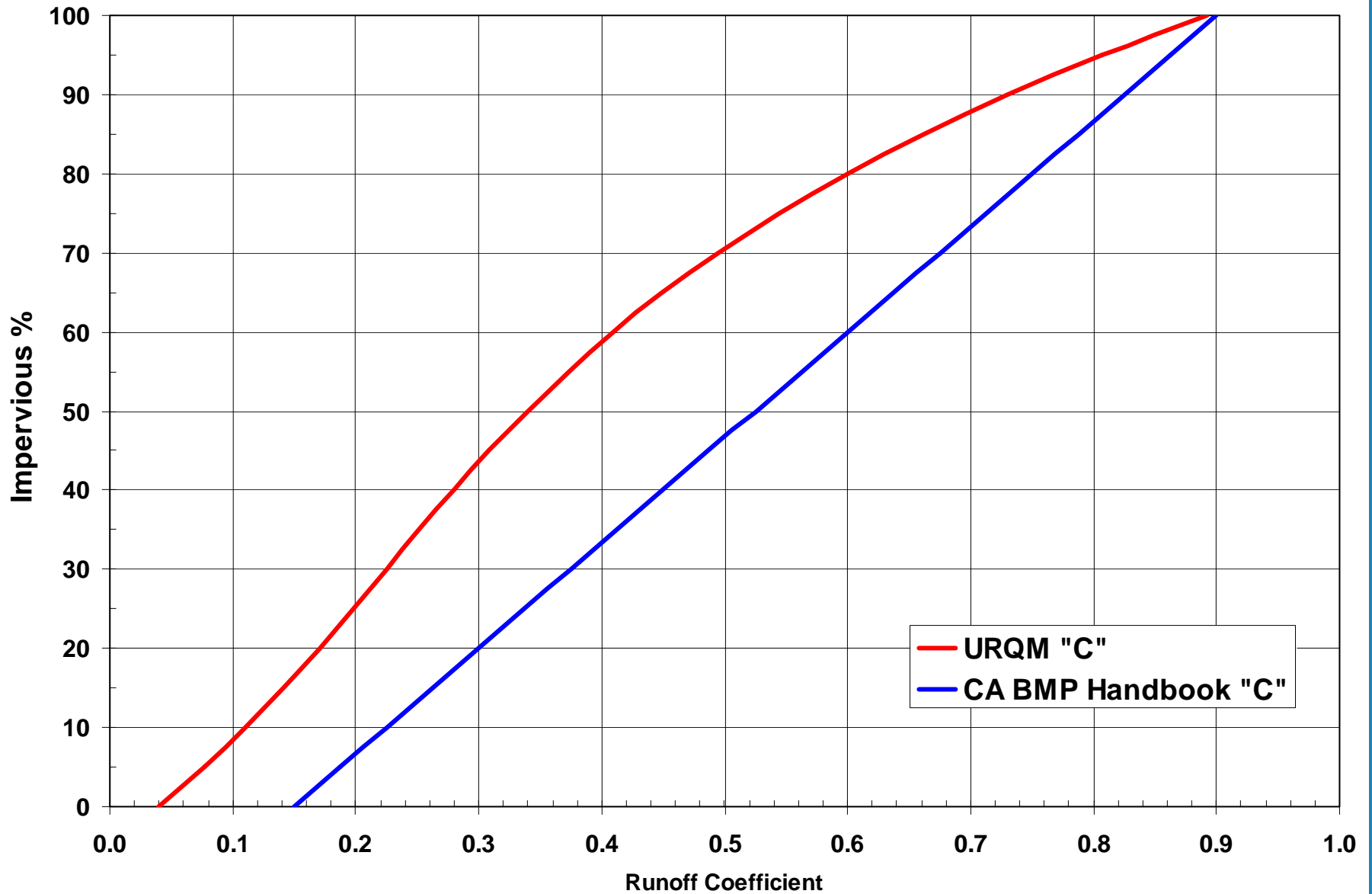




Important to Keep in Mind

- CA BMP Handbook and URQM use different runoff coefficient assumptions
- Don't co-mingle!

Comparison of Runoff Coefficient Assumptions Urban Runoff Quality Management vs CA BMP Handbook



Volume Approach Comparison

	CA BMP Handbook		URQM		
Impervious Area %	"C"	80% Runoff Volume (Inches)	"C"	85% Events Volume (Inches)	85% Runoff Volume (Inches)
100	0.90	0.42	0.89	0.70	0.85
75	0.71	0.32	0.54	0.42	0.52
50	0.53	0.21	0.34	0.26	0.32
25	0.34	0.11	0.20	0.15	0.19



Proposed Design Criteria Santa Clara Valley

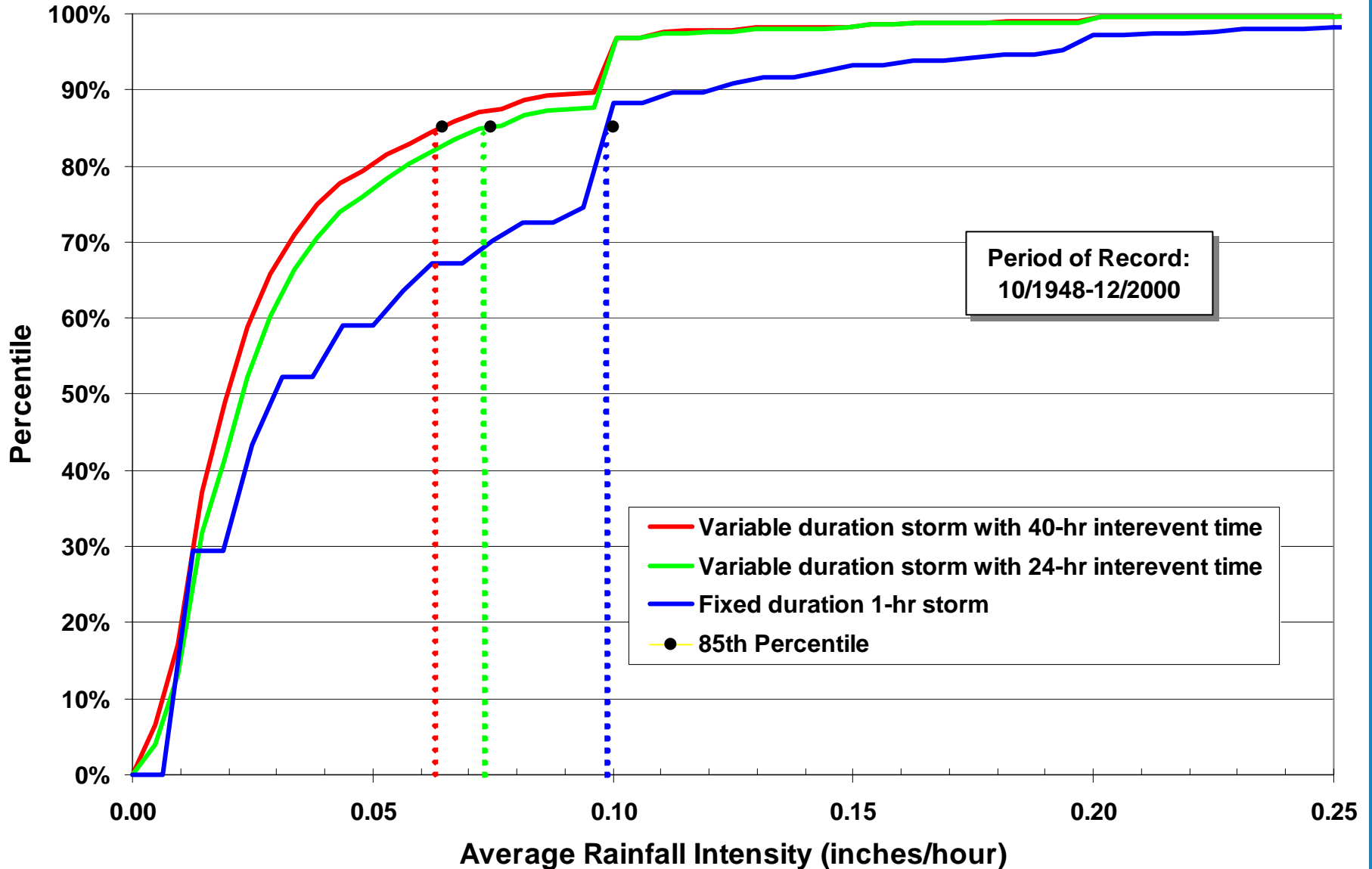
- **Flow Design Basis**
 - 10% of the 50 yr design flow
 - Straight forward, easy to determine
 - Flow that treats same portion of runoff treated using volumetric standards
 - Difficult to determine, has significant absolute compliance issues - Not Recommended



Proposed Design Criteria Santa Clara Valley

- **Flow Design Basis**
 - Flow produced by a 0.2 in/hr storm
 - Straight forward, easy to determine
 - Flow produced by 2X the 85th percentile hourly intensity
 - Current language is ambiguous – similar to previous reasons

San Jose NCDC Station (7821) - Santa Clara County, California
Cumulative Frequency Curves of Average Intensity for
Fixed-Duration and Variable-Duration Storm Events





Flow Approach Comparison

- **Intensity approaches**
 - Calculated intensities, ~0.06 ~ 0.10 in/hr
 - Doubling yields ~0.12 ~ 0.20 in/hr
 - Doubled figures are similar to the 0.2 in/hr option
 - Doubling intensity for design makes some sense – it factors out numerous “trace” events that do not produce runoff



Summary

- **Design criteria**
 - Provide equity in BMP implementation
 - Allow long-term assessment
 - BMPs
 - Changes in water quality
- **Proposed criteria**
 - Generally heading in the right direction
 - Relatively minor changes will make important improvements



Summary

- **Volumetric design criteria**
 - **URQM**
 - Simple to use
 - Yields somewhat higher volumes for Santa Clara Valley
 - **CA BMP Handbook**
 - Simple to use once complex hydrologic analysis is completed and curves developed
 - Yields volumes specific to Santa Clara Valley



Summary

- **Flow design criteria**
 - **10% of Q_{50}**
 - Simple to use
 - Yields site-specific results
 - **Intensity approach**
 - Simple to use
 - ~0.2 in/hr seems to be a reasonable target



Recommended Reading

- **Urban Runoff Quality Management (1998)** - Water Environment Federation and American Society of Civil Engineers
- **California Best Management Practice Handbooks – Municipal (1993)** – Camp Dresser & McKee Inc. et al. for the California Stormwater Quality Task Force (Note: the Handbooks are being updated and are scheduled for re-release in July 2002)
- **CA BMP Handbook feedback?**
 - <http://www.stormwatertaskforce.org/>



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