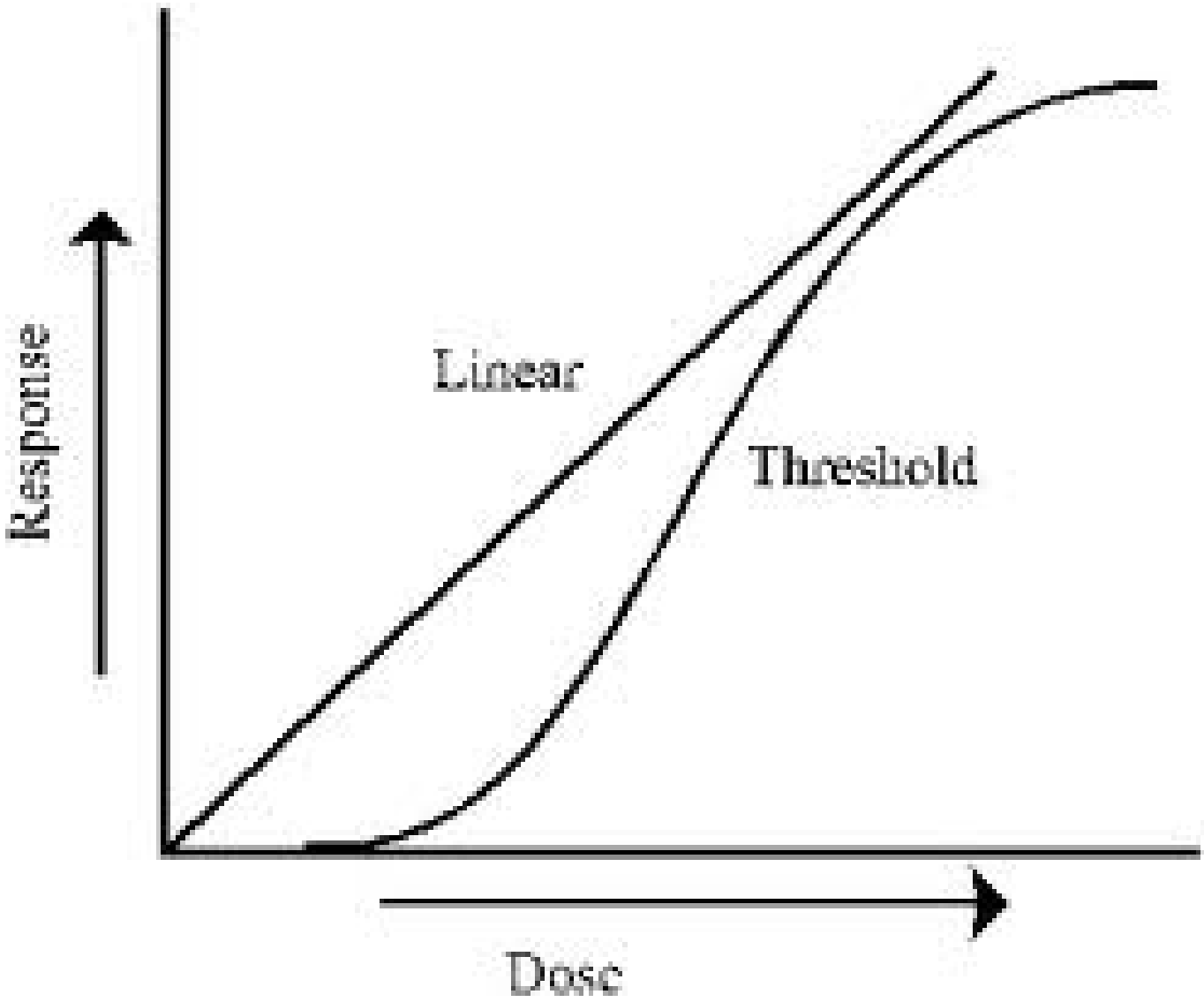
Assessing and addressing cumulative impacts

Amy D. Kyle, PhD MPH
University of California Berkeley
School of Public Health
<adkyle@berkeley.edu>

Key points

- Move beyond risk assessment as metaphor and method
- Recognize like discussions
- Consider scale of phenomenon, problem, and remedy
- Link analyses to actions through institutions
- Ally with push for sustainability

1. Beyond risk assessment


Response
Linear
Threshold
Dose

Broader metrics

- Measure more things (dust, traffic)
- Vulnerability metrics
- Inequality metrics
- Allow scoring to combine attributes

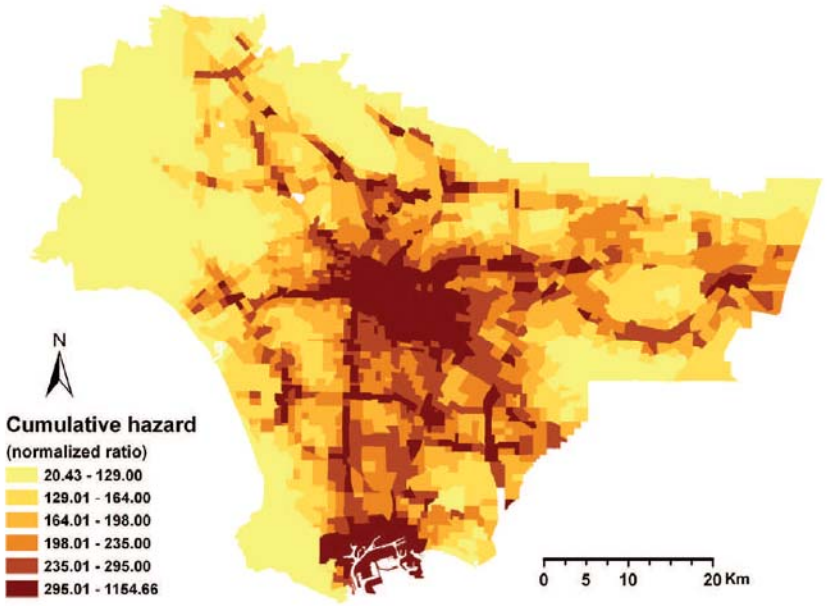
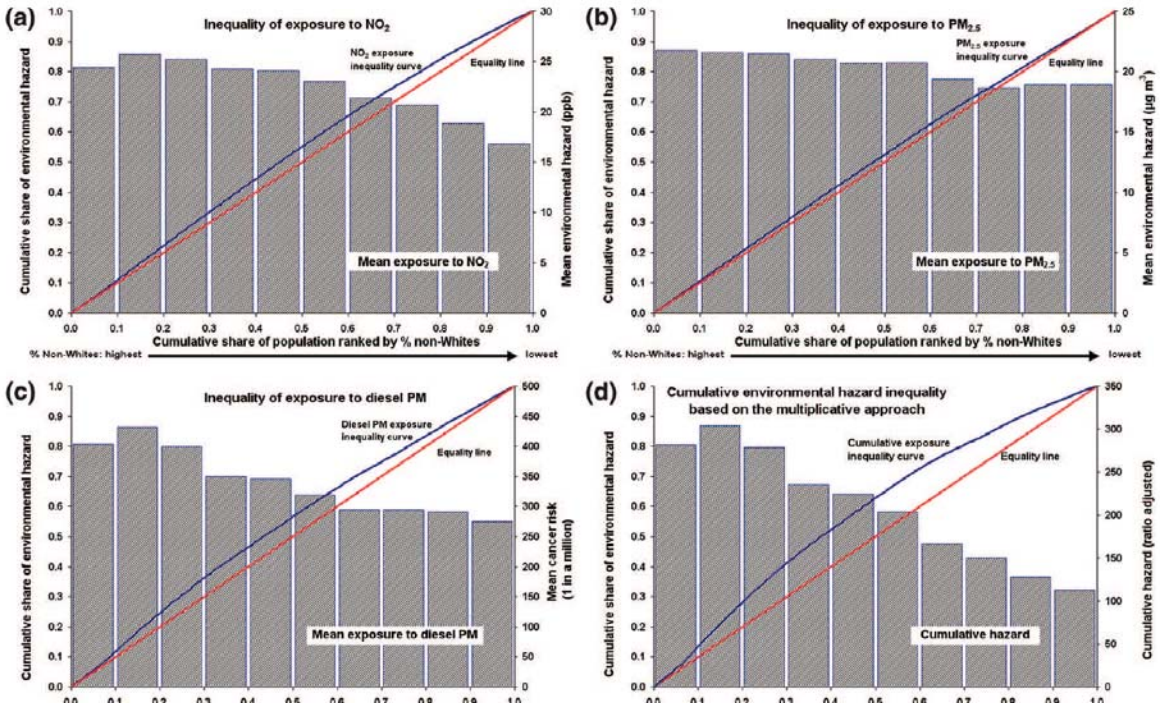


FIGURE 4. The cumulative environmental hazard using the multiplicative approach. Census tract level cumulative environmental hazard = $(NO_2)/(53) \times (PM_{2.5})/(15) \times (DPM)/(1)$.



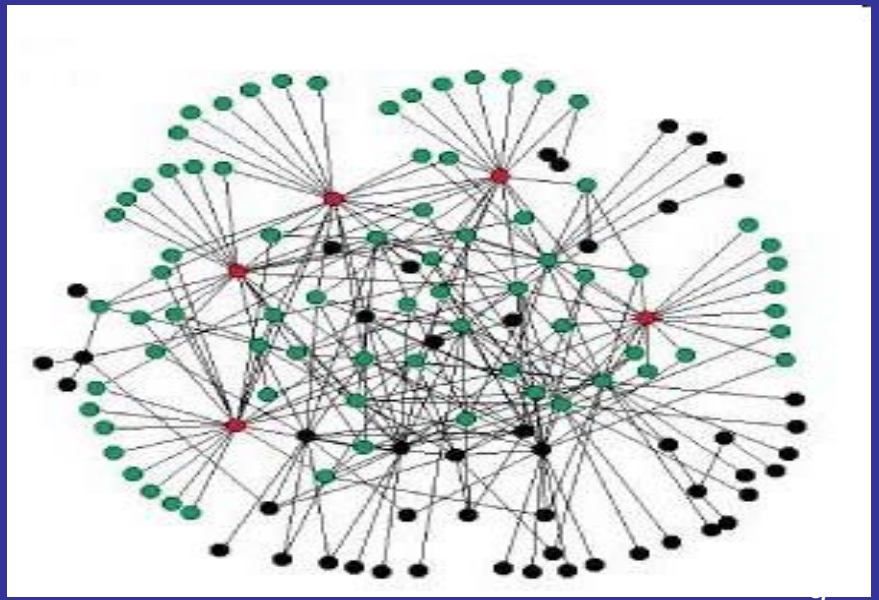
Qualitative approaches

- Enough is enough
- Scoring
  - Percentile based
    - compare to overall distribution
  - Benchmark based
    - compare to value with known significance
  - Rank (high medium low)
- Trends
- Sensitive population adjustment

2. Recognize like discussions

Newer scientific knowledge

- Health disparities are persistent, significant, and partly related to environment
- Some are more susceptible and more vulnerable to effects
- Biology as network
- "Exposome"



Agreement on need for change

- National Academy of Sciences –
  - Science and Decisions
  - Cumulative risks and impacts
  - Non-chemical stressors, vulnerability
- Recognize "community wisdom"
  - From assessment of problem to design of solutions
  - From generic to specific
  - Support community aspirations to improve

3. Consider scale for phenomena, problems, remedies

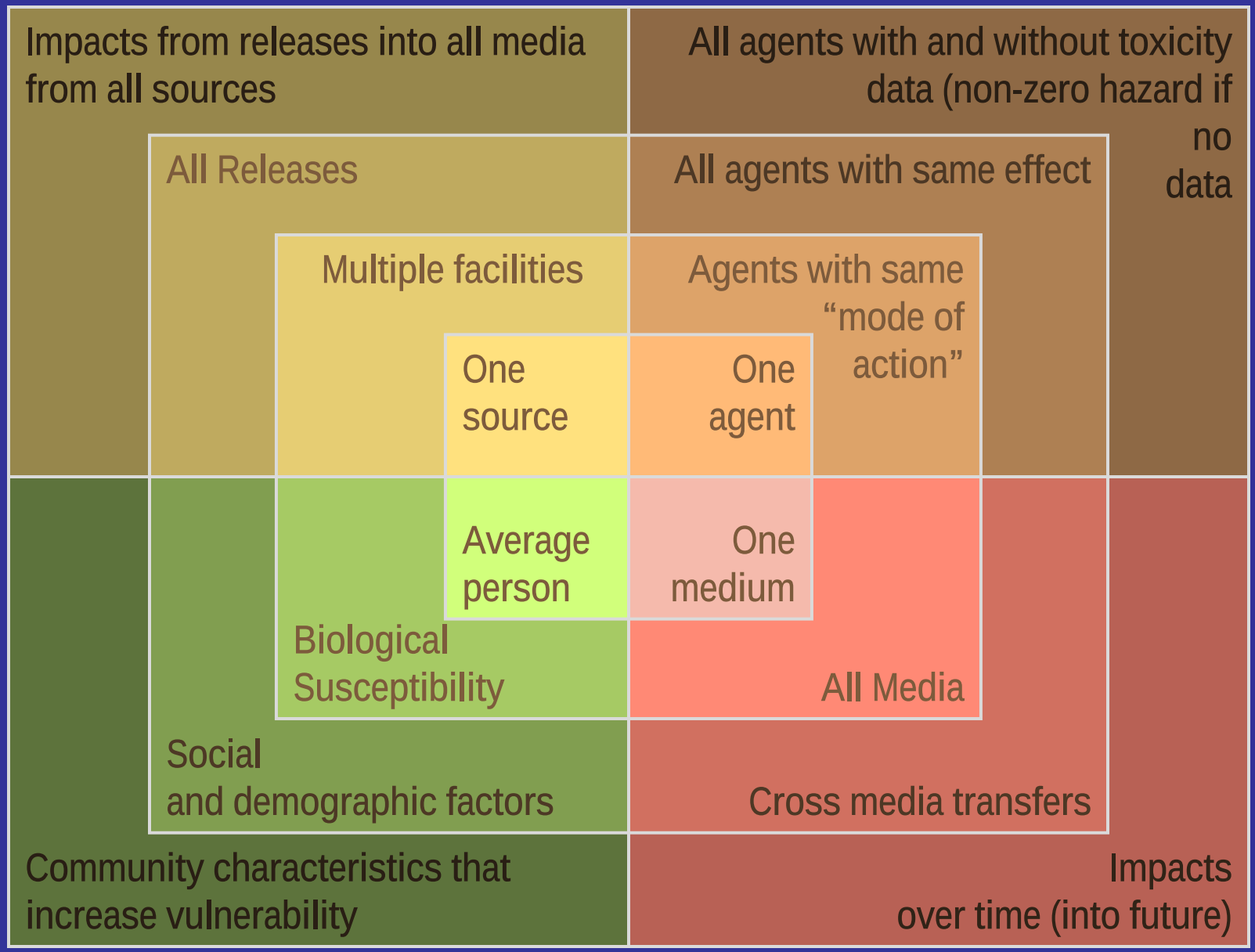
- Neighborhood
- Community or municipality
- County
- State or region
- Nation
- Global

Assessment contexts

- Community-initiated assessments
  - EPA CARE projects one example
- Area-based "screening" assessment
  - Identify areas of concern
  - Can apply to multiple decisions
- Context- based assessment
  - Prompted by need for decision or action

4. Link analyses to actions through institutions

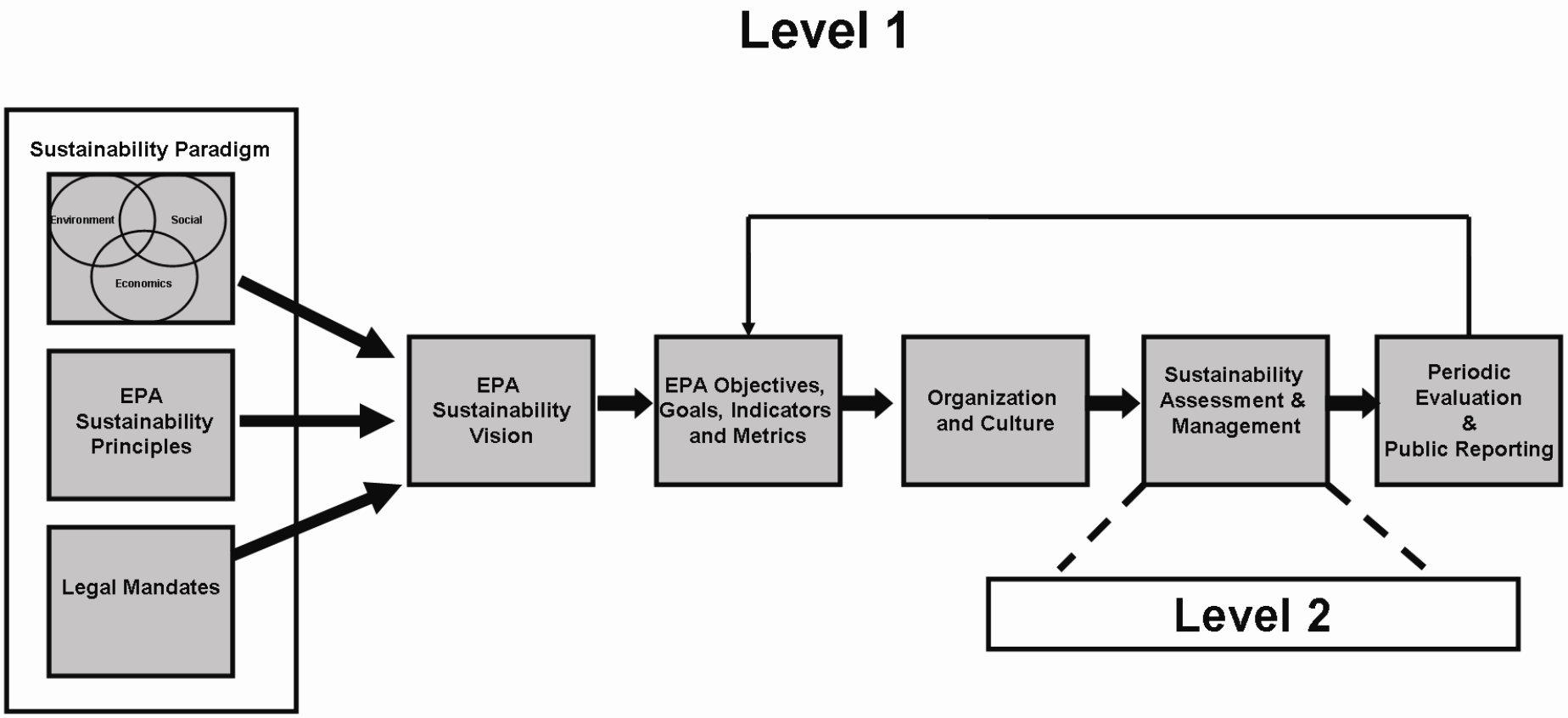
Better reflect reality in constructs



Advance methods in land use

- Land use controls to limit maximum impact
- Special provisions for mega facilities
- Sophisticated environmental criteria
- Greater integration of processes
  - e. g, SB 375 – air, transportation, housing)
  - Needed as well to address climate change

5. Ally with push for sustainability



National Academy of Sciences. 2011. **Sustainability and the US EPA**. Model for sustainability decisions at US EPA.

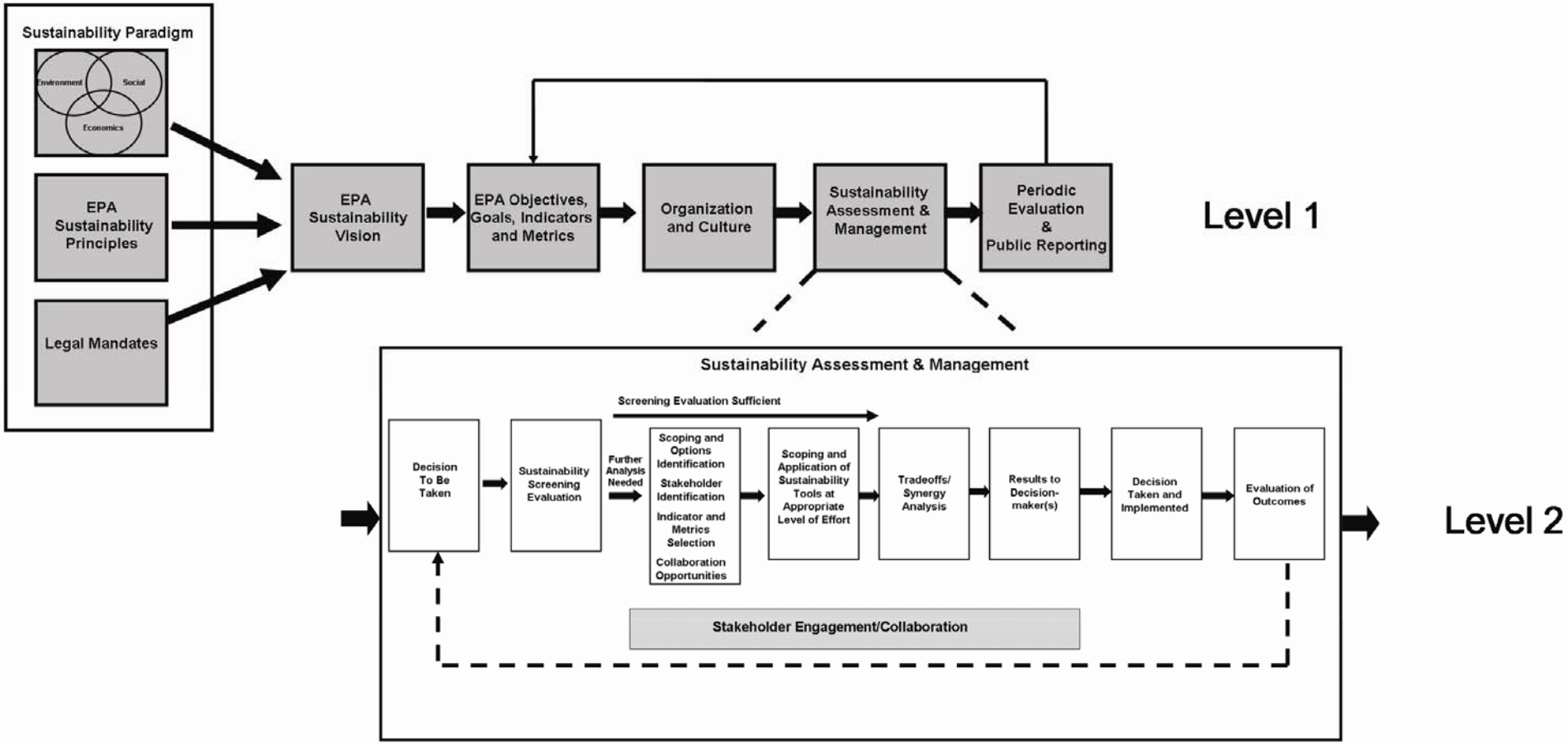
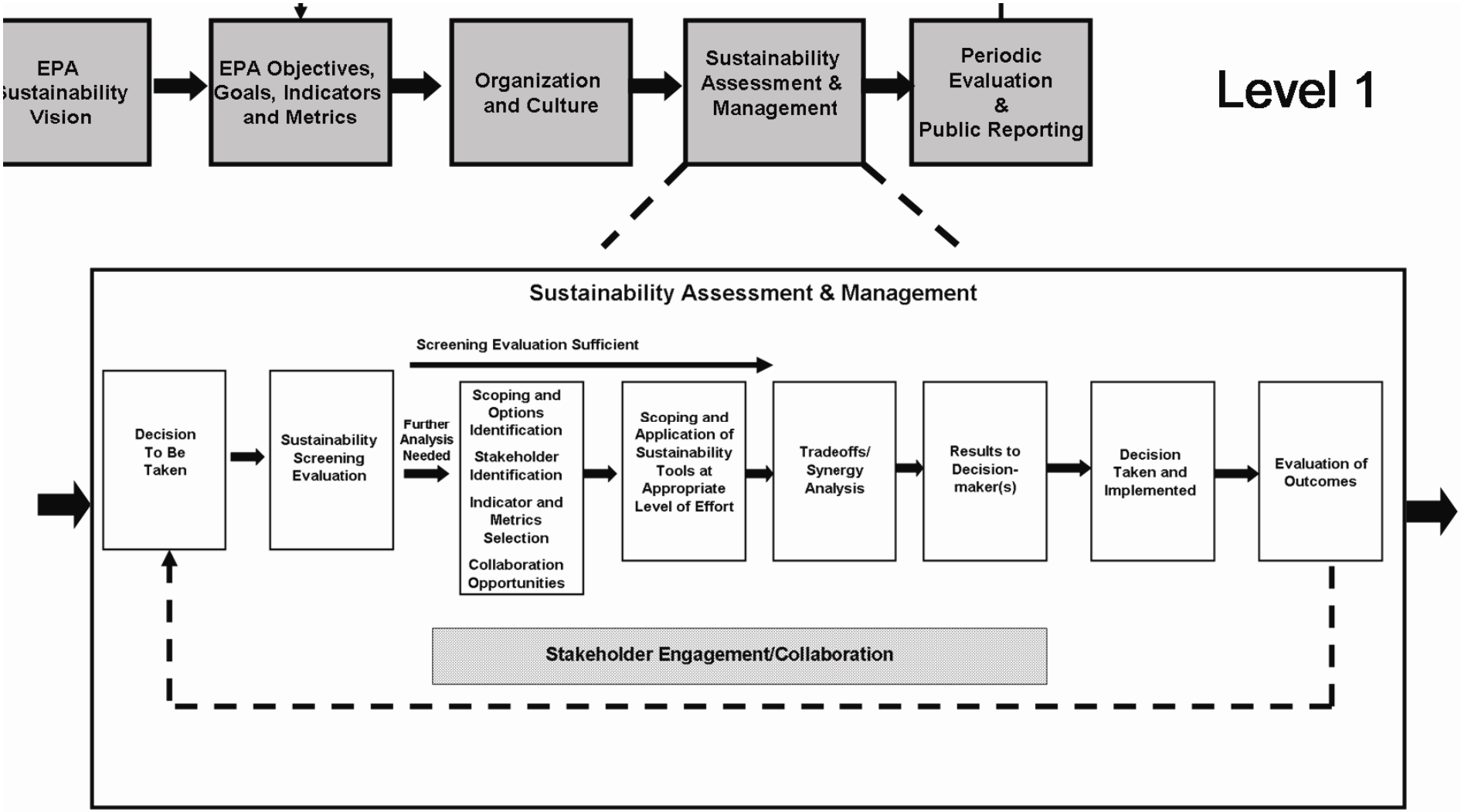


FIGURE 3-1 A framework for EPA sustainability decisions


EPA Sustainability Vision
EPA Objectives, Goals, Indicators and Metrics
Organization and Culture
Sustainability Assessment & Management
Periodic Evaluation & Public Reporting
Level 1
Sustainability Assessment & Management
Screening Evaluation Sufficient
Decision To Be Taken
Sustainability Screening Evaluation
Further Analysis Needed
Scoping and Options Identification
Stakeholder Identification
Indicator and Metrics Selection
Collaboration Opportunities
Scoping and Application of Sustainability Tools at Appropriate Level of Effort
Tradeoffs/ Synergy Analysis
Results to Decision-maker(s)
Decision Taken and Implemented
Evaluation of Outcomes
Stakeholder Engagement/Collaboration

Thanks!

Amy D. Kyle

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