Green Infrastructure – How to Institutionalize Organics Diversion & Compost Use through local/state & government/business collaboration

David McDonald
david.mcdonald@seattle.gov
www.SoilsforSalmon.org
www.BuildingSoil.org

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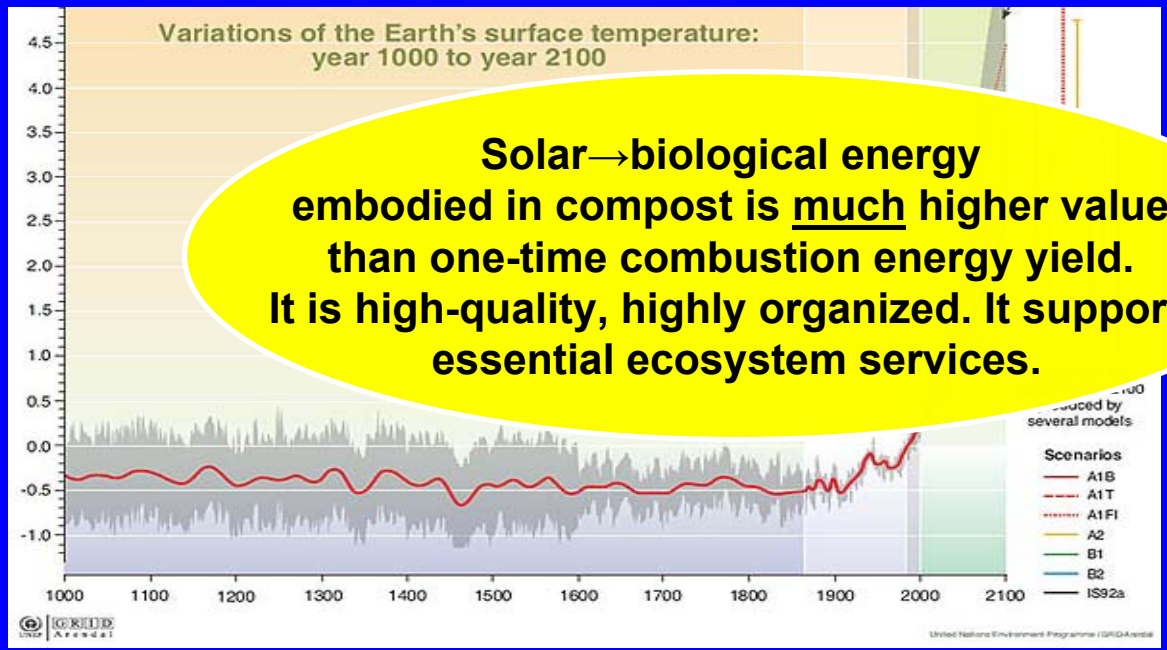
Seattle Public Utilities
and the
Washington Organic Recycling Council

Why Green Infrastructure?

(composting, sustainable landscaping, soil building)

When the going gets tough, **Natural Systems** have:

- Lower energy demands
- Lower maintenance (working with nature is always easier)
- Higher resiliency = more dependable
- Are locally empowering and adaptable over time



Solar→biological energy embodied in compost is much higher value than one-time combustion energy yield. It is high-quality, highly organized. It supports essential ecosystem services.

What we know:
Climate (& related) challenges, next 20-50 years

↑ Intense storm events

= stormwater loading, flooding, wind damage

↔ Precipitation variability

= ↓ snowpack, ↔ water supply, ↑ multi-year variations (e.g. alternating drought & flood)

↑ Energy costs & demands: transport, cooling/heating

= changing transportation demands, building requirements

↓ Agricultural productivity (due to soil loss, fertilizer costs, weather, climate & political disruptions, etc.)

= local/global food disruptions, ↑ transport costs

Composting is not just "waste diversion"
It is the foundation of green infrastructure

Organics cycling → Healthy Soil for:

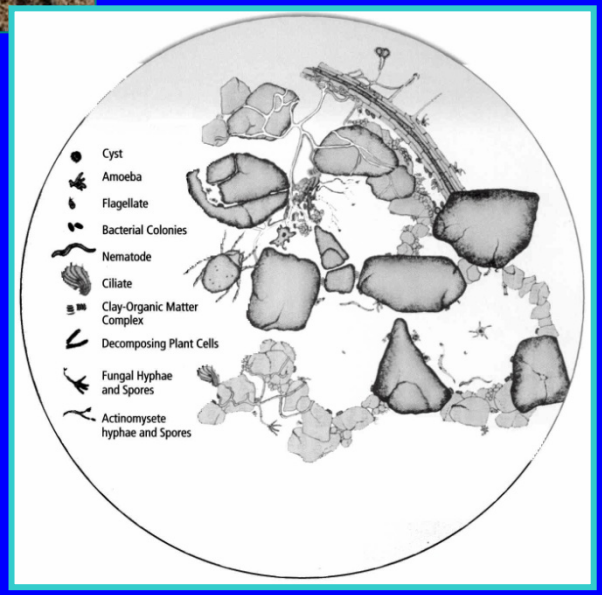
- Trees
- Stormwater management (Low Impact Development)
- Water conservation (the cheapest "new supply" of water)
- Sustainable landscapes = urban livability, air quality, etc.
- Sustainable local/regional agriculture
- Climate mitigation (↑carbon sequestration/↓methane) and
- Climate moderation (reducing building heating/cooling) =
- Energy conservation (the cheapest form of bio-energy)

Has the added benefit of cost-effective waste diversion

Background: Organics in Seattle

- 1987: voters rejected incineration
- 1988: Backyard composting bins and education
- 1988: Curbside recycling; 60% Recycling Goal (2008 at 47%)
- 1989: Yard Waste curbside collection
  - 1998 food waste research & pilots begin
- 2005: Mayor's Climate Protection
  - 0.25 tons of GHG per ton of food waste
- 2006: Recyclables banned from garbage
- 2007: Beyond 60% Recycling
  - 72% recycling by 2025
  - Food waste emphasis: <u>food recovery first!</u>
- 2009: Food waste collection citywide
  - household & commercial curbside

Value of Healthy Soil



Billions of soil organisms:

- Support healthy plant growth, fertilize, protect plants from disease
- Create soil structure, resist compaction
- Provide stormwater infiltration
- Prevent erosion
- Reduce summer water needs
- Filter out pollutants (oil, metals, pesticides, etc.)
- Reduce need for landscape chemicals

The Connection Between Soil and Water

Benefits of Soil Best Practices

- More marketable buildings
- Better erosion control
- Easier planting, healthier plants, fewer callbacks
- More attractive landscapes, that sell the next job
- Easier maintenance for customers (healthier plants, fewer weeds, less need for water, fertilizer, pesticides)
- Reduced stormwater runoff, with better water quality
- Regulatory compliance (current and upcoming regs)

WA Dept. of Ecology Stormwater BMP: "Post Construction Soil Quality & Depth"

- Retain native soil and vegetation wherever possible
- All areas cleared and graded require 8 inch amended soil depth:
  - **Soil organic matter content 10% for landscape beds, 5% for turf areas**, (S.O.M. by loss on combustion method)
    - 10% S.O.M. results from roughly 30-40% compost by volume added to low-organic subsoil.
    - May use native topsoil, incorporate organic amendments into existing soil, or bring in topsoil blend to meet spec
  - pH 6-8, or original pH
  - Subsoil scarified 4 inches below 8-inch topsoil layer
  - Protected from compaction after amendment
  - Mulched after planting, & maintained by leaving organic debris

Now part of national Sustainable Sites criteria (different O.M. req's by region)

Building Soil guidelines manual for implementing BMP T5.13

- Manual developed regionally with experts
- Practical methods to achieve soil standards:
- Develop a "Soil Management Plan" for each site
- <u>Four options for soil management in different areas of site:</u>
  1) Leave native soil & vegetation undisturbed, protect from compaction
  2) Amend existing soil in place (with compost or other organic)
  3) Stockpile site topsoils prior to grading for reapplication
  4) Import topsoil meeting organic matter content standards
- Choose pre-approved <u>or</u> custom calculated amendment rates
- Simple field inspection and verification procedures
- Includes model specs written in CSI and APWA formats
- Available at: **www.BuildingSoil.org**

Building Soil
Foundation for Success

Putting Organic Amendments to Work

Putting organics to work - SEA Streets

Street Edge Alternative onsite detention demo, Seattle Public Utilities and SDOT.

- Compost in wet and dry zones
- **98% reduction in runoff.**

www.seattle.gov/util/NaturalSystems

Broadview Green Grid, Seattle
(right after Oct. 2004 "100 year" storm)

- Compost-amended soil in bio-retention swales
- Erosion control with compost blankets, berms, and socks

WsDOT: Erosion control, water quality, successful landscapes with lower mtce. costs

SR 14, Vancouver
Coarse compost, blown in
Note erosion where not applied

Chelan, effective repair of
10-year recurring erosion site

Extensive soil bio-engineering info at:
http://www.wsdot.wa.gov/eesc/design/roadside/sb.htm

Combine methods as needed for best water quality and flow control

WsDOT - Protecting Wetland Area from I-5 Runoff

Selling healthy soil to customers:

Value to builder/contractor

- Less plant loss = fewer callbacks
- Making money on materials and labor
- Quicker planting in prepped soil
- Easier maintenance
- Better appearance sells next job

Sell quality & savings to customer

- Better plant survival/ health/ growth/ appearance
- Lower water bills, easier care
- Reduced chemical needs = better for family health
- Better for salmon: reduces storm runoff, improves water quality

Redmond Ridge

- Grade site 12 in. below finish
- Install foundation, along with driveway & walkway rock pads
- Spread 14 in. amended soil mix, (will settle to 12 inches) rip in first lift to mix with subsoil
- Soils blended offsite from native duff plus compost
- Soil organic matter controlled to ~10%, pH and C:N ratio for optimal plant growth

Building a Soil Quality Movement, 1999-present

- One-on-one with policy makers, building industry leaders
  - Partner with professional org's, "green" leaders, & regulators
- Engage (fund!) scientists in meaningful research
- Soils for Salmon technical "how to" seminars around state: 22 events/1600 design & engineering professionals
- Soil quality starts to appear in policy statements, priorities for watershed restoration, stormwater mgmt.
- Write soil BMPs for State Stormwater Manual, etc.
- Local gov't and WsDOT projects prove it works, is cost-effective
- Educate engineers, LA's, landscapers, planners -
- Effective web-based resources – *link it up!*
- NPDES regulations push LID, incl. soil
- Reach builders through erosion control classes, demos, articles, mail/email/web and one-to-one

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Example: Erosion control trainings for builders

- "Certified Erosion and Sediment Control Lead" (CESCL) now required by State on all construction sites
- Compost erosion control BMPs, and soil amendment BMP, are part of the trainings
- 1200 builders trained in classes and field demo's in last 18 months

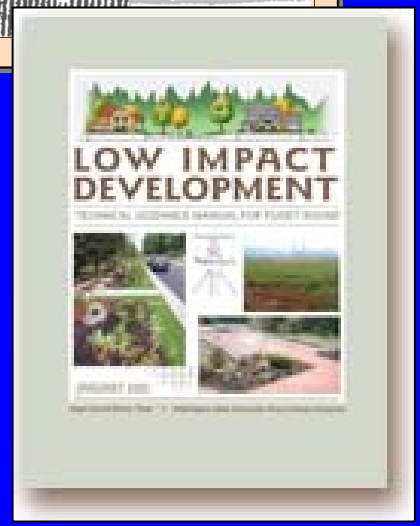
Builders get 2-for-1 value when compost is used for erosion control, and then tilled in to meet the Soil BMP!

Compost

No Compost

Which site is selling the next job?

Links to useful soil BMP specifications:



Building Soil guidelines manual
for implementing WDOE Soil Quality & Depth BMP (includes APWA & CSI specs) with resources for builders at
www.BuildingSoil.org
or, with more resources for designers, at
www.SoilsforSalmon.org

LID Technical Manual, Puget Sound Partnership
www.psp.wa.gov/LID

Seattle's "Natural Drainage Systems" specs
www.seattle.gov/util/NaturalSystems

National specs coming in ASLA/USGBC "Sustainable Sites" criteria, to be incorporated into LEED **www.SustainableSites.org**

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Builders, developers, and landscapers
are adopting practices that preserve and improve the soil on building sites, grow healthier landscapes, and protect waterways. Local governments are beginning to require these practices.

In a century of resource limits and climate change, healthy soil is the foundation of sustainable urban infrastructure: water, air, food, energy, resource recycling, stormwater, livability & other green services.

Composting builds that foundation.

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Science and design: www.SoilsforSalmon.org

Builder's info: www.BuildingSoil.org

What are your challenges? Who can you collaborate with?

- Organics recyclers: composters, wood processors, biosolids, agriculture, bio-energy, waste haulers, product marketers
- Scientists: land grant universities, regional, USDA/NRCS, climate etc. scientific opinion leaders
- Game changers: stormwater & civil engineers, DOT's, water supply planners, energy planners, public health agencies, green building and climate change advocates, public-based environment, community, and regional quality/ag/food/green-jobs economic development groups
- Do-ers: builders, developers, landscapers, LA's, erosion pro's
- Regulators EPA, state, and local: stormwater, water, energy, agriculture, public health, homeland security . . .

Questions, Issues To Ponder

- Are state composting rules the biggest hurdle to building infrastructure?
  - States with rule modifications …. Length of time to get rules adopted?
- Perception Vs. Reality
  - What are perceived environmental and public health risks?
  - What are “real” environmental and public health risks?
- Green jobs and local revenues?
- Collect data!!!