

Water... our First Frontier.

Strategic Sustainable Planning 2010 BC Food Network @ Ymir

SSP 32

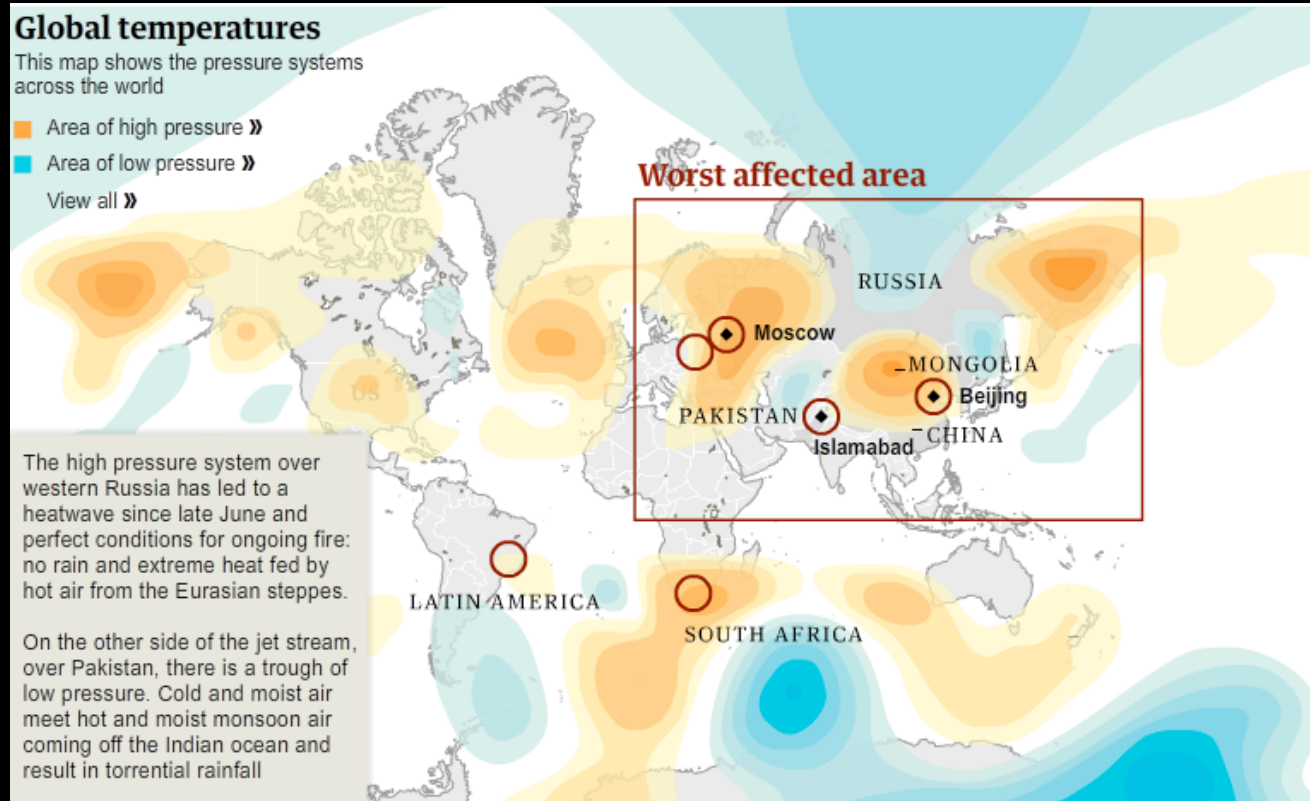
Post Oil Settlement in BC
A 2010 Initiative



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2638 W 14 Ave., Vancouver, B.C. V6K 2W9 T (604) 731-0206 Fax (604) 734-2638
email: balfourarch@telus.net ; www.plancanada.com Planning Advocate Urban Design Transportation

Famine Alert 2010.07.10



Planning for Oil Shock: New Patterns of Community for Real Sustainability:

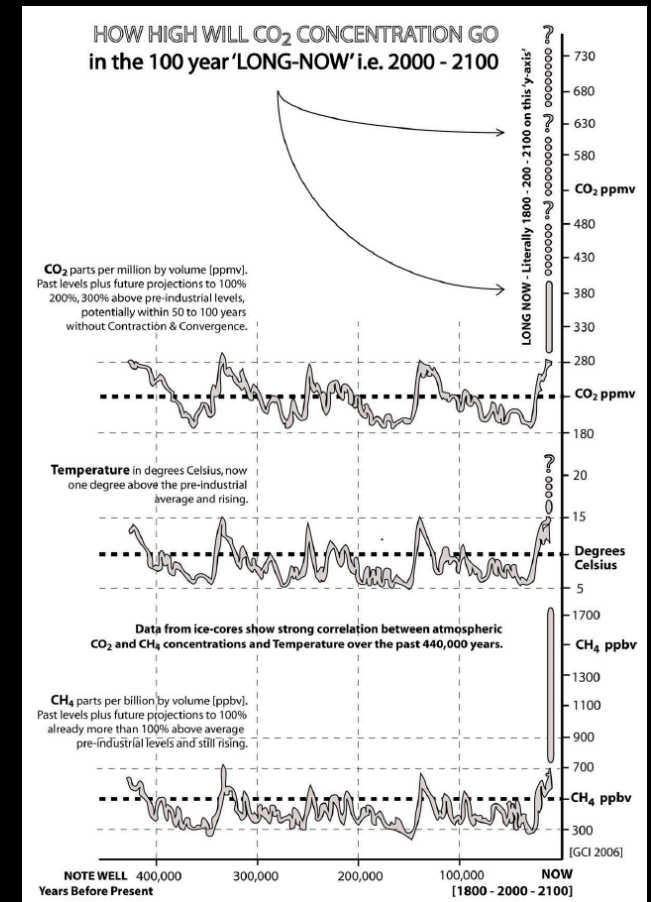
the 3 R's

Rapid
Radical

Resource Poor



The Manual from
Old City Foundation Press
Vancouver
Planning Commission Gaming for Global Impacts on City
& Culture



Peter Salonijs

Billion 2006 global hectares

Legend:

- Ecological Footprint (red line)
- biocapacity (green line)
- Ecological debt (pink area)

Infrastructure Types and Lifespans:

- Car (9 years)
- Nuclear power station (40 years)
- Highway (20-50 years)
- Bridge (30-75 years)
- Coal station (20-75 years)
- Human (32-82 years)
- Commercial building design (50-100 years)
- Other Infrastructure (50-150 years)

Timeline: 1960, 1970, 2000, 2010, 2040, 2060, 2080, 2100

Key Feature: A yellow star marks the year 2060, indicating a critical point in the ecological debt.

These factors
can not all
play out

Land Use Type	Change since 1970
Built-up Land	↑ 7%
Forest Land	↑ 6%
Fishing Ground	↑ 53%
Grazing Land	↑ 57%
Cropland	↑ 210%
Carbon Footprint	↑ 75%

Source: Global Footprint Network. 2009 National Footprint Accounts

The chart illustrates the projected growth of global oil demand. The United States and Europe are the largest consumers, followed by Japan/Australia/New Zealand, Russia/Caspien, and Emerging Asia. The Middle East and Africa are projected to have the smallest shares of total demand. The total demand is projected to reach approximately 340 MBDOE* by 2030.

Year	United States	Canada	Europe	Russia/Caspien	Japan/Aus/NZ	Emerging Asia	Latin America	Middle East	Africa	Total
1980	35	5	25	10	10	15	5	5	5	110
1990	40	5	25	10	10	20	5	5	5	130
2000	45	5	25	10	10	30	5	5	5	160
2010	50	5	25	10	10	50	5	5	5	210
2020	55	5	25	10	10	70	5	5	5	260
2030	60	5	25	10	10	110	5	5	5	340

Source: EIA, AEO2009

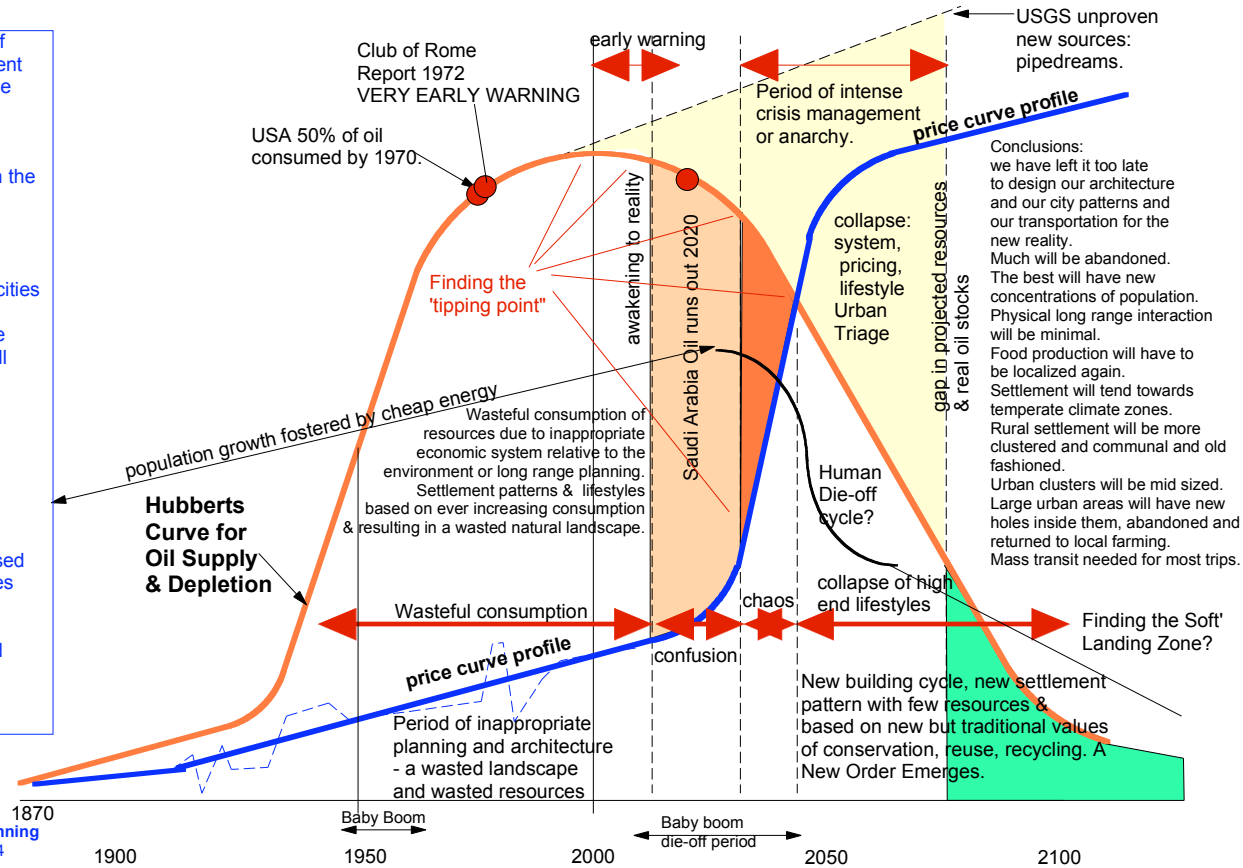
Hubberts Curve & Sociology Strategic Sustainable Planning 2005

THE DEPLETION OF RESOURCES & THE IMPACT ON PATTERNS OF HUMAN SETTLEMENTS:
THE NEED FOR LONG RANGE STRATEGIC SUSTAINABLE PLANNING.

We are neglecting the design of appropriate patterns of settlement & transportation systems for the fast approaching new reality of energy scarcity & resource depletion.

We need strategies to deal with the following new realities:

- settlements will tend to be located in temperate climate zones & on higher ground.
- large sections of our existing cities will be abandoned as they are unsustainable. New appropriate concentrations of population will emerge as physical long range interaction becomes minimal.
- food production will return to restricted smaller areas and serving local needs.
- mass transit will be used for inter and intra city movement of people & goods.
- settlements will be compromised of smaller towns, smaller houses & narrower streets.
- localized industry, farming & market return. Proximity to food production, social networks & natural reserves will mark points of new community.



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2003.11, after Hubbert, Rees. rev 06.04

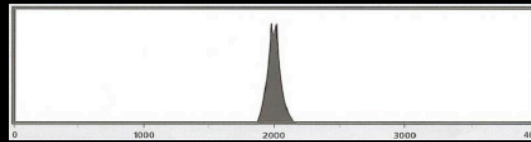
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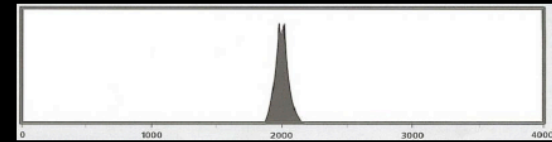


Our Point in Time:

Oil Curve in relation to history:

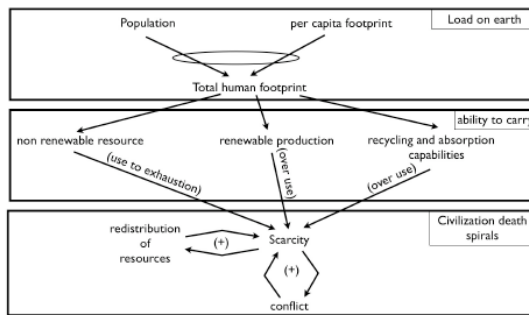


Human Population too??????

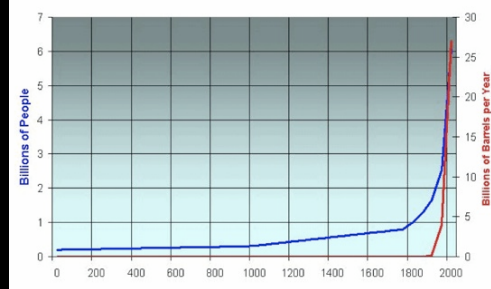


Current Culture and Civilization is blip in geological time.
 We have harvested 500 millions of years of stored solar energy & wasted it.
 The human population explosion matches Hubbert's Curve on oil consumption.
 Our numbers pretty well have to follow the oil depletion curve down.
 Technical Solutions for energy replacement are not enough, nor reliable.
 How do you follow the graceful adjustment and find a soft landing spot?

How Civilizations Collapse

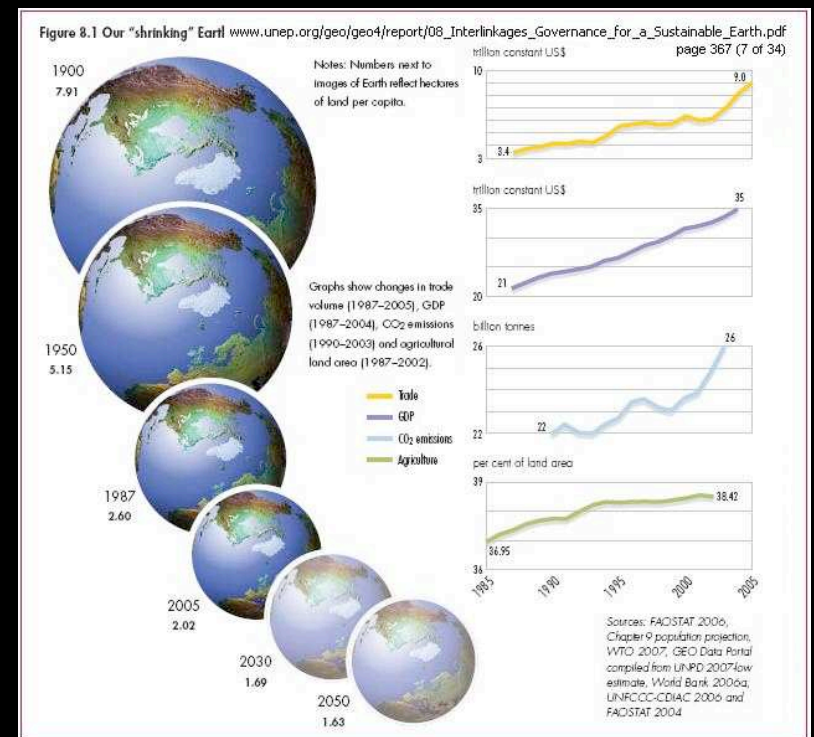


World Population and Oil Production



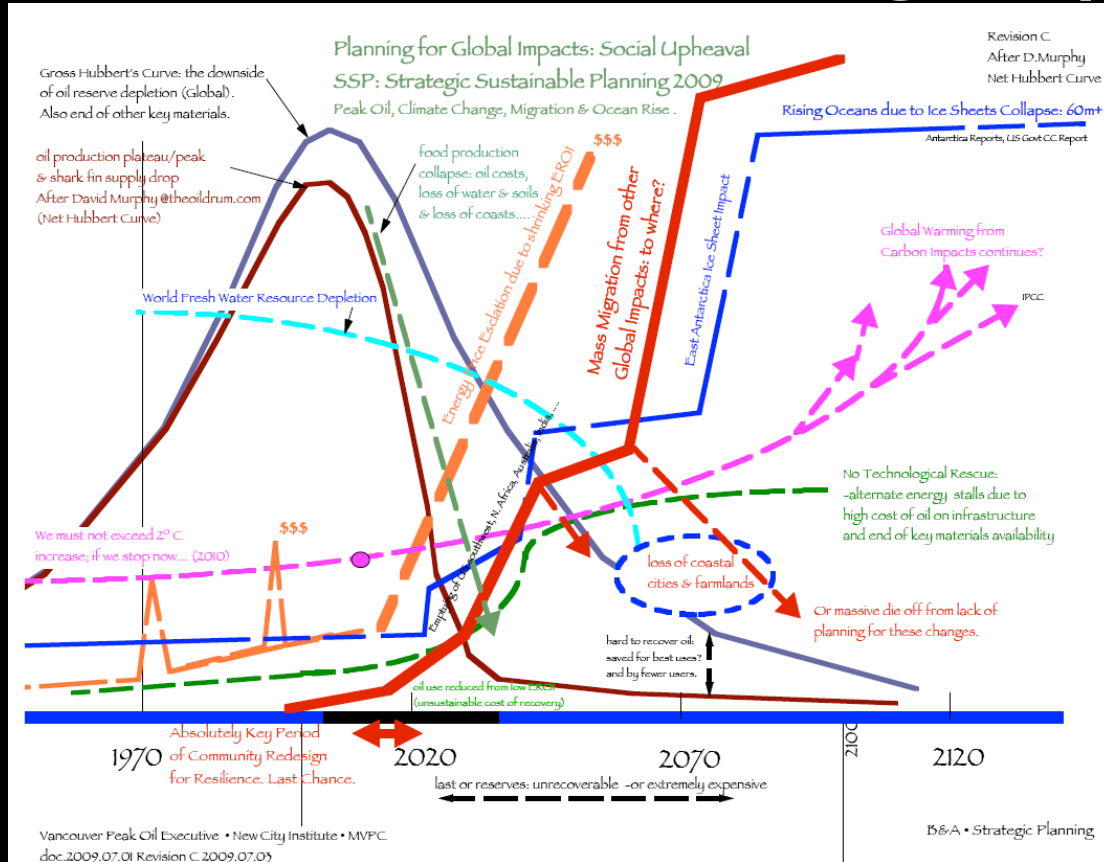
Global Impacts 2010+

- Peak Oil: the end of cheap energy, failure of urban structure. Since 2005 the oil supply curve and EROI have steepened; end of supplies will happen sooner and energy price shock arrives earlier.
- Climate Change: loss of food & water, mass migration starts.
- Ocean rise: unknown extent and timing, just another factor.



Shrinking earth via over consumption

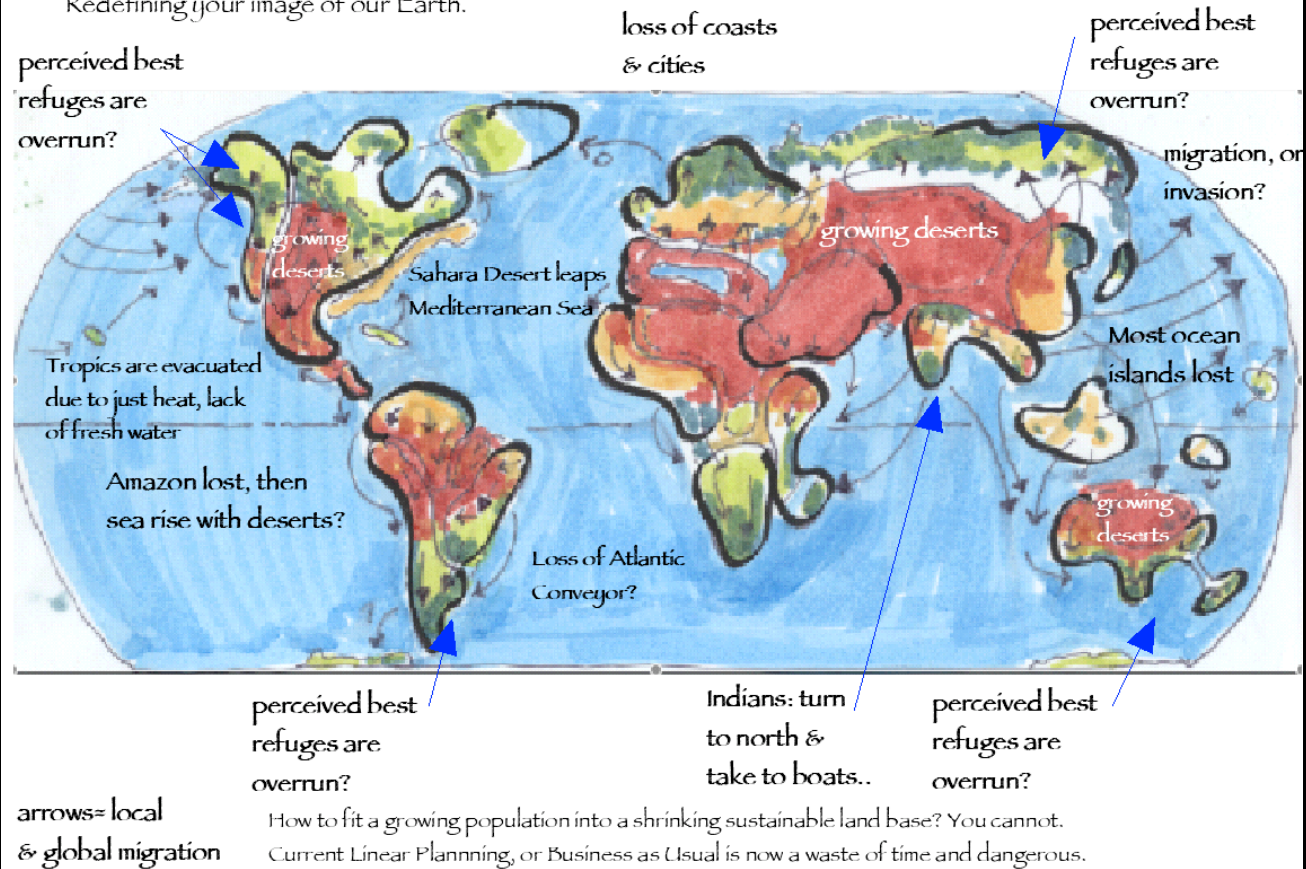
Combined Planning Impacts: updated



Adjustment period for any soft landing is now much shorter: options are reduced the longer we put off needed action.



Macros of Global Shifts: Post Oil, Climate Change Quantum Planning 2050. Redefining your image of our Earth.



Living on Mountain Slopes II SSP II

B&A Strategic Planning 2010



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~ some really round numbers

Canada

huge net gain

USA

net loss

Mexico
net loss

net gain
Europe

big net gain
Russia

China

signet loss

India



loss of is

loss of island
nations

Australia/N
rough balance

big gain
South

tries for Antarctica

Shifts toward
poles but not
above 60°

General loss
in equatorial band

Shifts toward
poles but not
above 60°

loss of island
nations

boat invasions

2010 pre crash population

2020 reduced population left in place

—2020 migrant portion of population on the move

—2030 resultant added population to a sector/refugees

Richard Duncan/Olduvai Theory
says we can have on of these to
last 100 years. It started in 1930.

Richard Duncan/Olduvai Theory
says we can have on of these to
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- Population Growth
- Energy consumption growth
- Planet heating
- Globalized Trade

Production
& trade of
STUFF

U.S. economy
goes in tank

- GLOBAL INTEGRATION
- JOBS SHIPPED TO ASIA
- U.S. unemployment soars
- Purchase collapse/ poor of U.S.

currency crash
banks crash
Public saves banks
housing crash

Global
economy
goes in tank

Sales fail
China has
job losses

↓ loss of oil/economic shifts

End of Globalization
Re-start of localized
economies

Learning from the old world
Rhizome pattern of sustainable
community, or collapse.
Your choice.

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Climate change

rainfall pattern shift

Climate change
land/economy
shock

rising oceans

end of suburbia
end of Alpha cities
de-industrialization

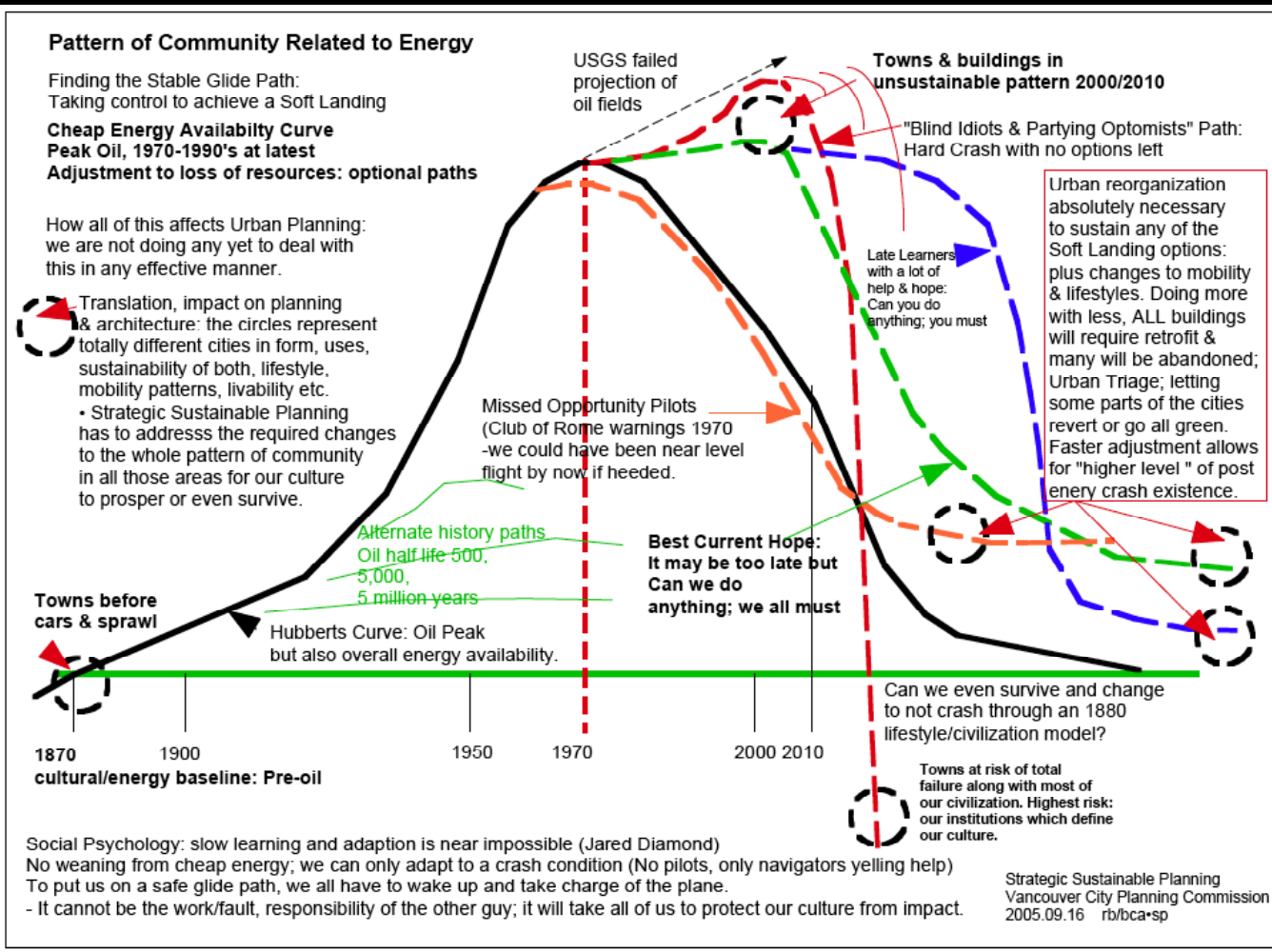
mass migrations

Radical shift in pattern
of community, lifestyle
& mobility.

no long distance food sources, local food production is necessity.

→ Social consciousness/paradigm shifts

or collapse



MOVEMENT:

Needed:
Rapid & radical
change to the
pattern of
community.

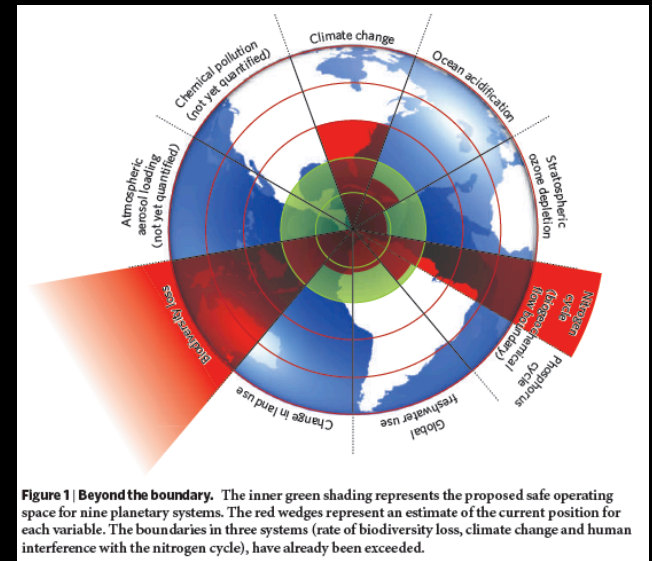
Not small steps
and don't take
too much time
talking.

Rising Awareness: Moving to Actions beyond Planning.

2005: Peak Oil and Climate Change were starting to become issues in the public realm but with much resistance & persistent denial from vested interests and amateur skeptics.

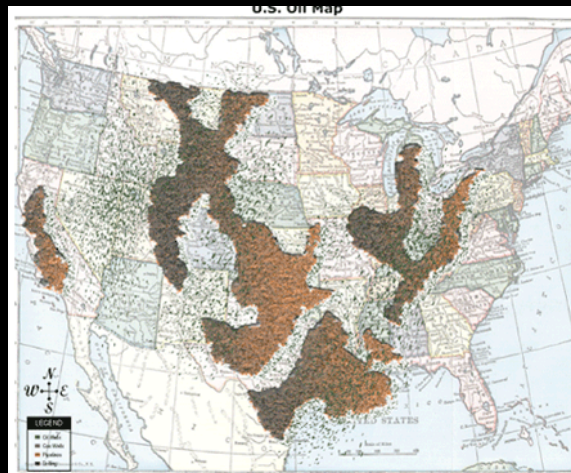
2010: Now we move into dealing with the problem and looking at solutions: how does EROI affect food, cities, jobs, survival.

2011+: Secondary impacts arise: mass migration, wars over the diminishing resources, what extent do rising oceans impact us.

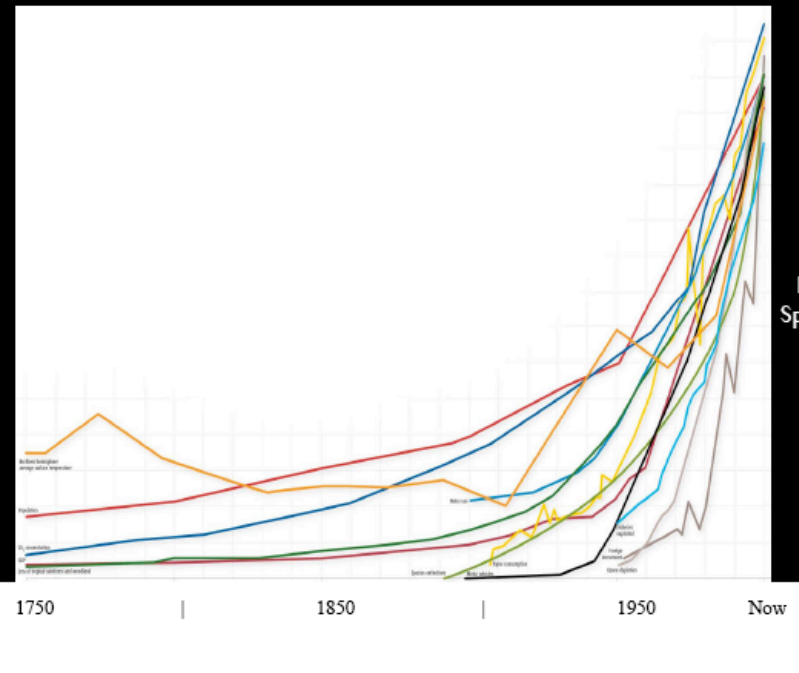


Understatement.

Before we move on, it is not just oil...



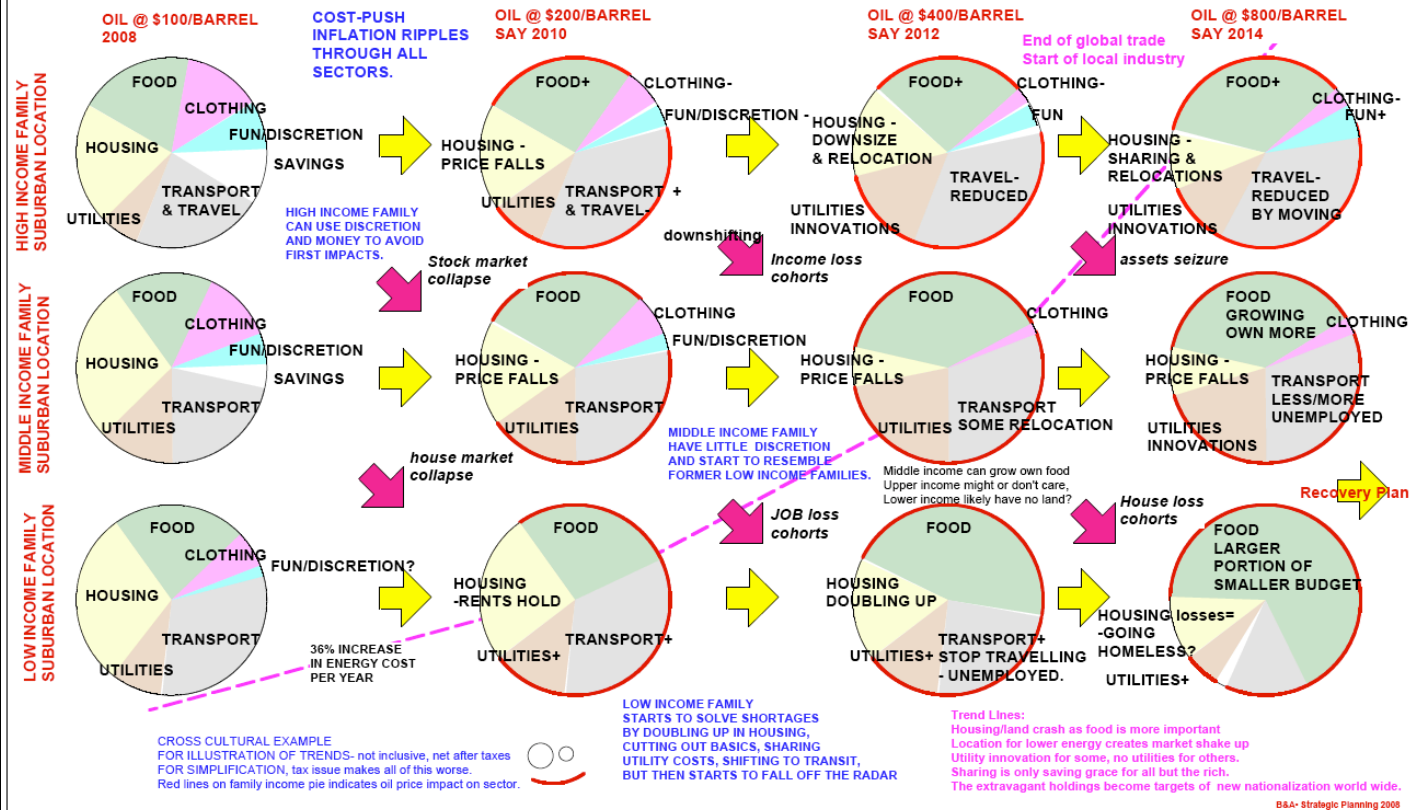
Average °C
Population
CO2
Forest Loss



water use
Fisheries
Paper use
Ozone loss
Motor vehicles
Species extinction
etc

& false hopes, delaying necessary adaptation...

A sociological perspective on Peak Oil and Family

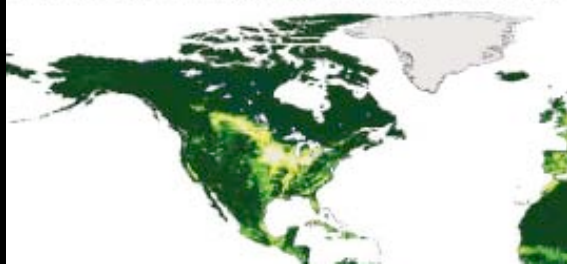


Family Income & Post Oil Economy: ...Not so good...WVASF

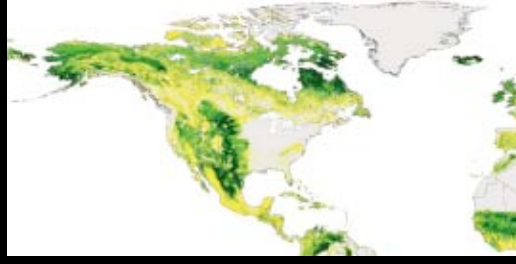
Re-ruralization, Re-localization, Marbleization



Proportion of land not under cultivation or built-up



...after subtracting forests, deserts and other non-vegetated areas



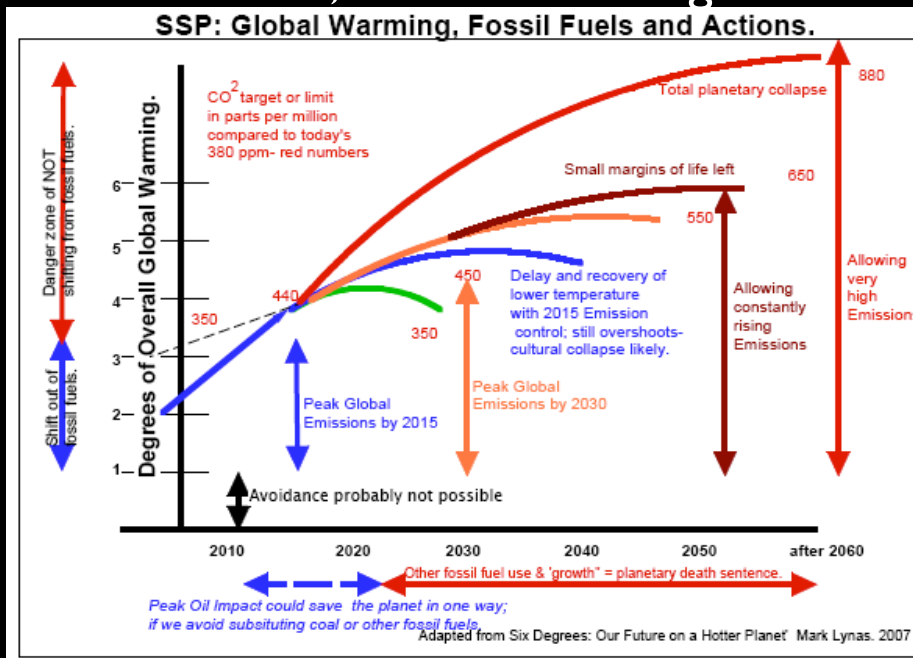
...and then subtracting mountains and areas that are unsuitable for agriculture



...and of course, Global Warming...

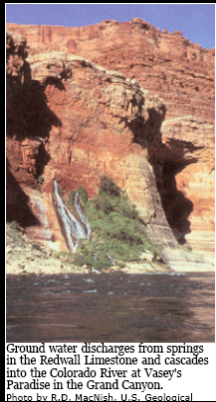


- North America Net Arable Lands?
- -now, and in 2050?



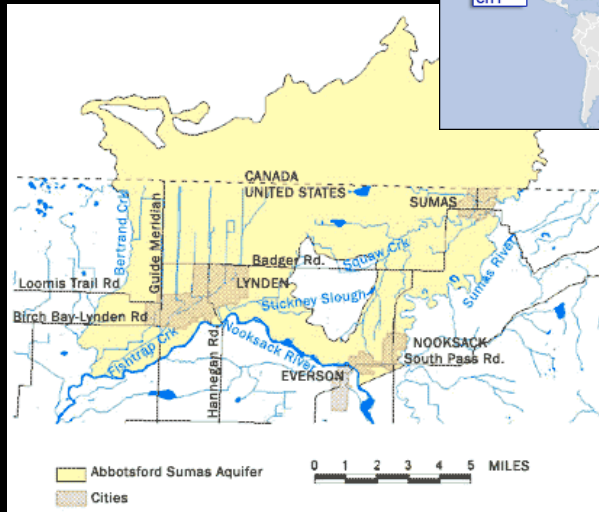
from
Mark
Lynas
6°

Ancient Aquifers Dying

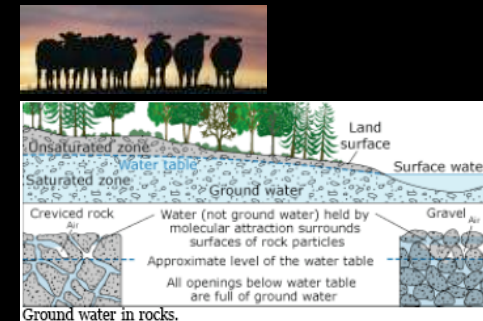
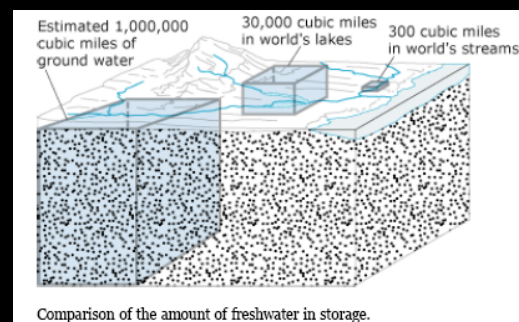


Ground water discharges from springs in the Redwall Limestone and cascades into the Colorado River at Vasey's Paradise in the Grand Canyon.
Photo by R.D. McNish, U.S. Geological

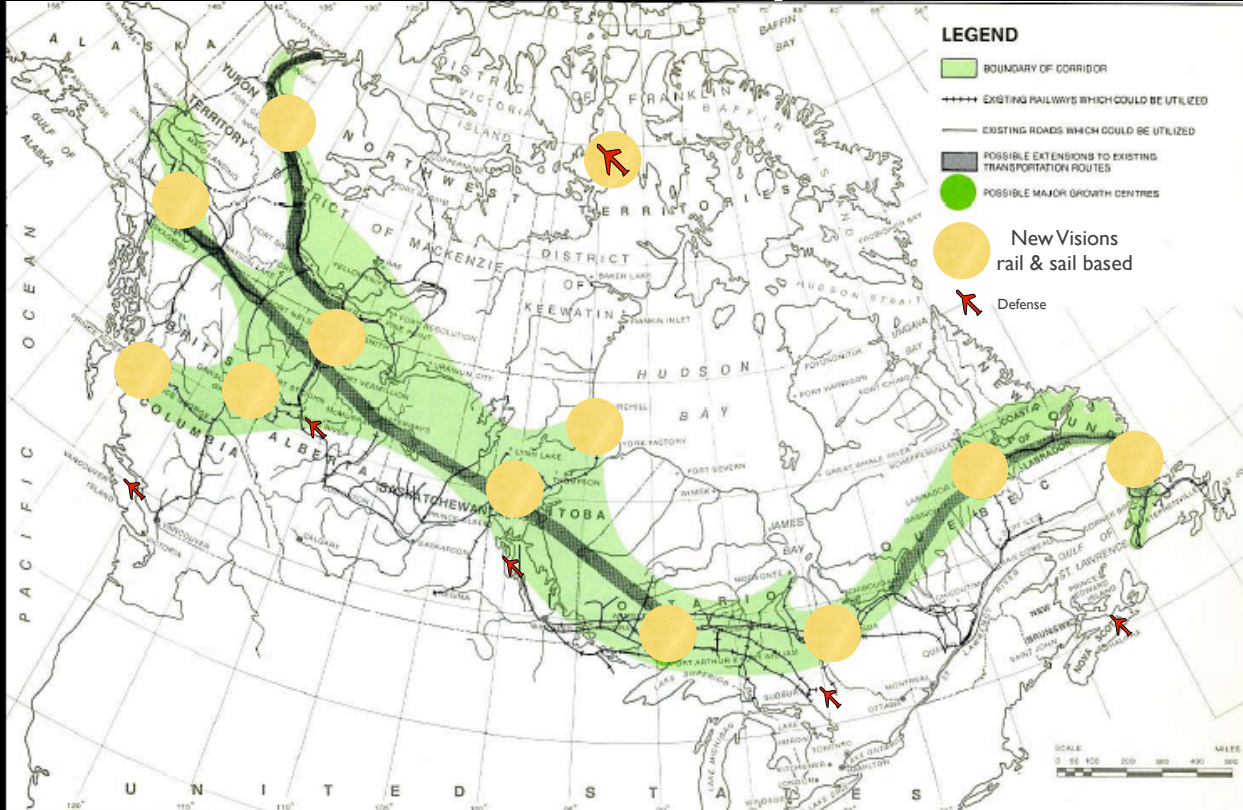
Many aquifers cross international boundaries, making control & protection impossible as each we beggar our neighbour to consume the resource first.



World Losses trigger new migrations....



The Mid Canada Development Corridor



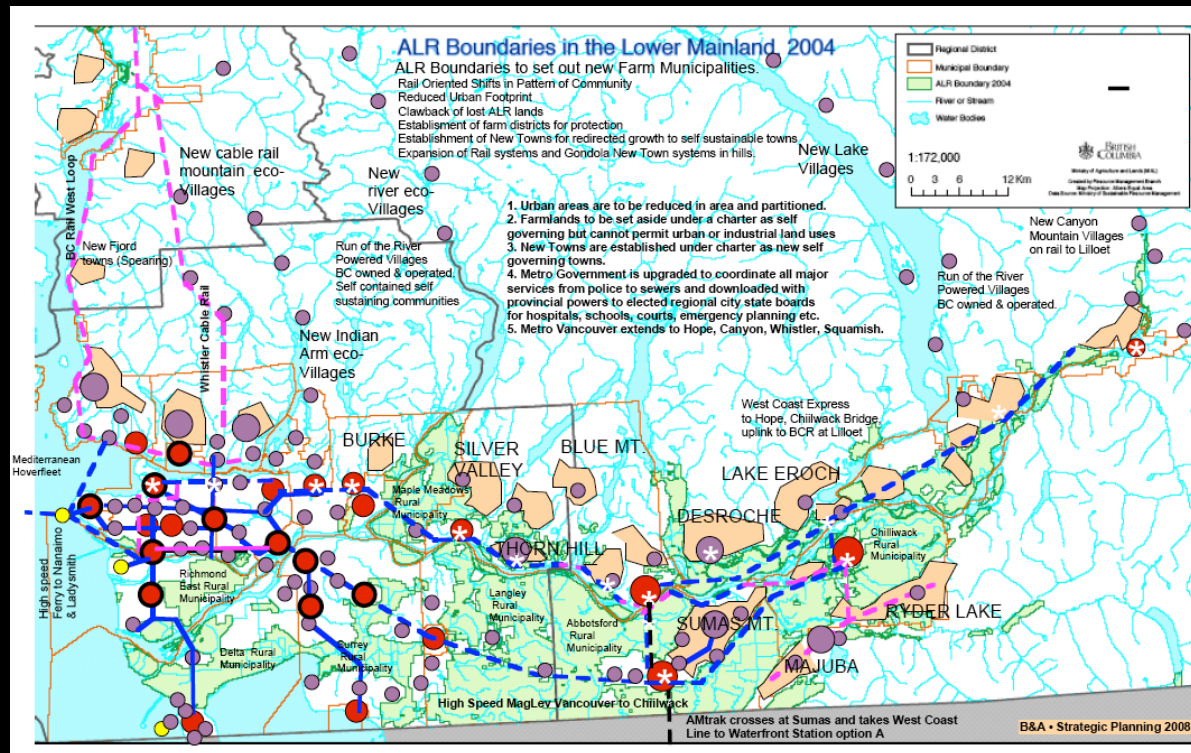
Proactive Solutions



What limits?

Do we take in post oil & climate change refugees, or not?

SSP series: urban focus Metro Hilltowns & Rail Service Now..

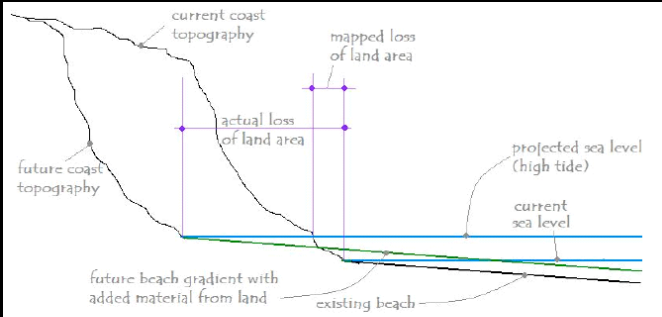


Post Oil Settlements
on hills, served by
rail, gondolas and
maritime ferries.

Claw back of lost
Agricultural Lands.

Avoidance of any
more floodplain
settlement.

Another cause of mass migration: Contingency: 6m Ocean Rise: Vancouver

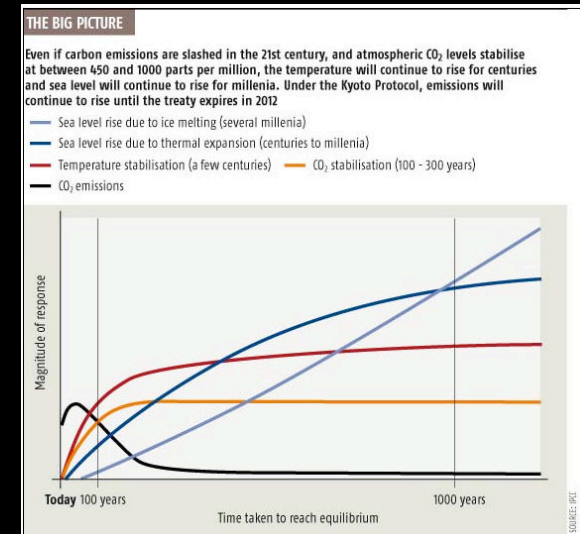
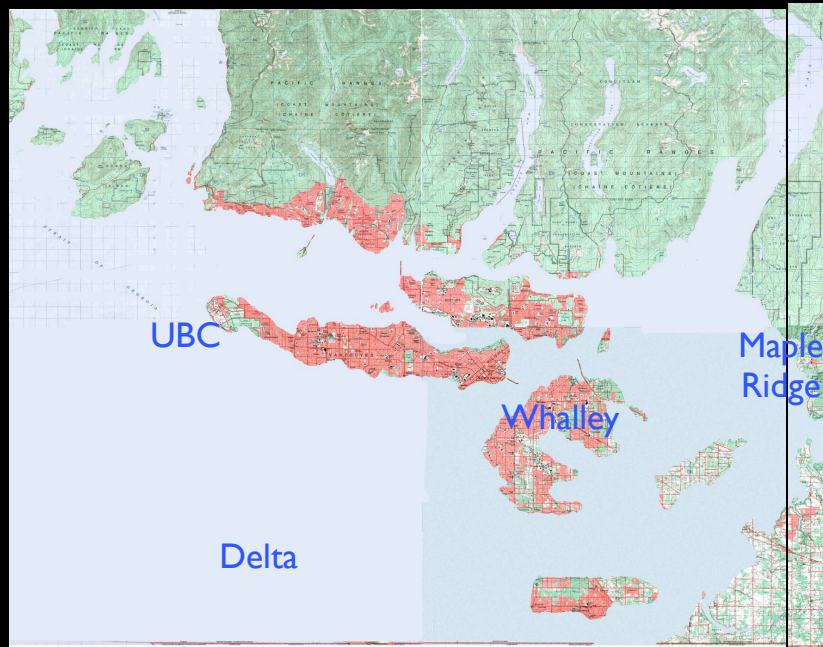


People will only comprehend this SLR problem when their insurance companies no longer want to underwrite their risks. I was trying to explain what happens to steep banks when sea level rises, so I drew this diagram to show how a future high-tide line is actually an extension of the beach slope, and implications for erosion thereof. David Shipway graphic, 2009.



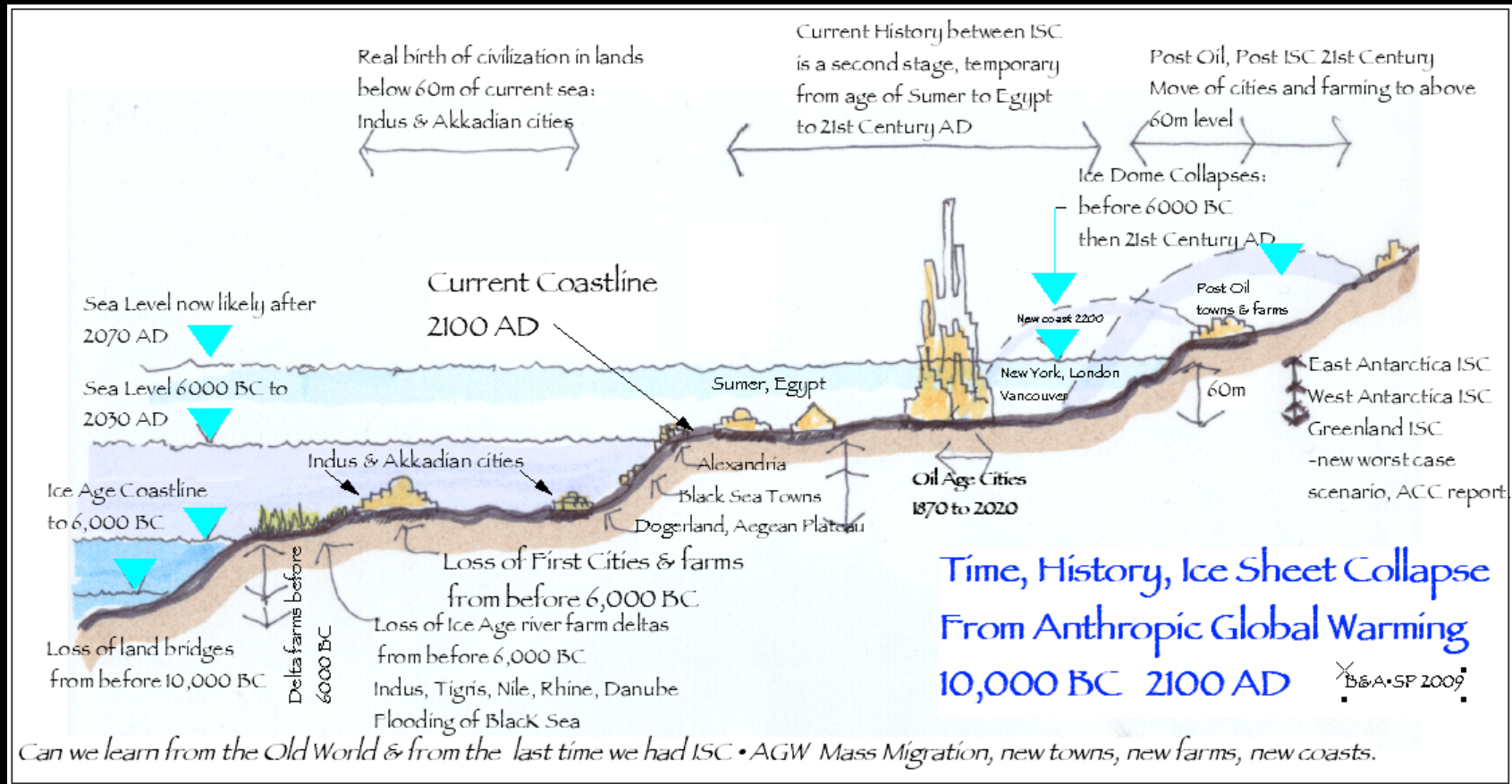
The pay-back for
wasting a century of
carbon fuels.

Timing?
uncertain
but
imminent

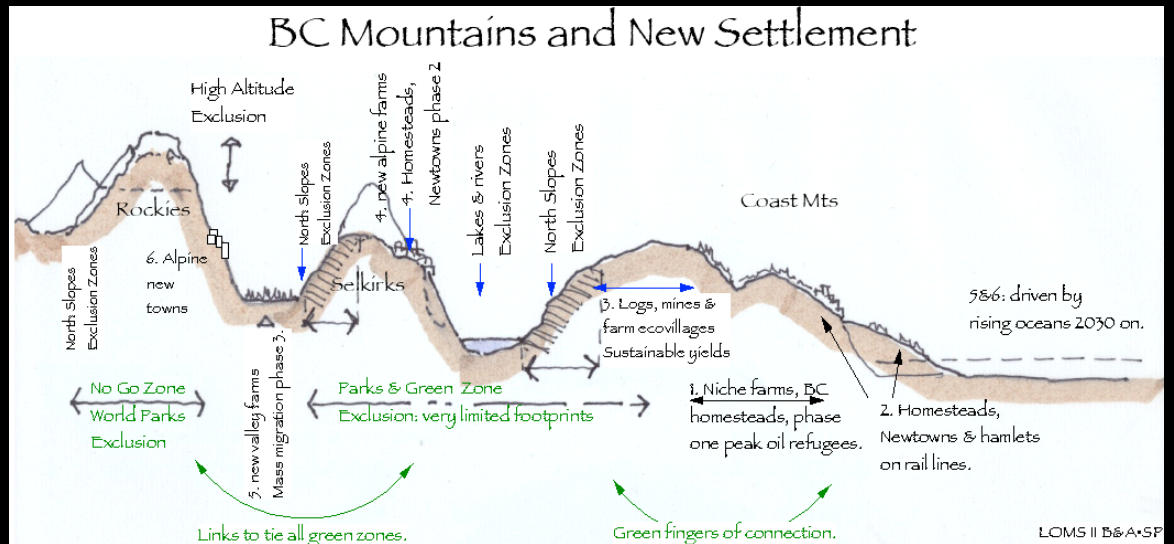
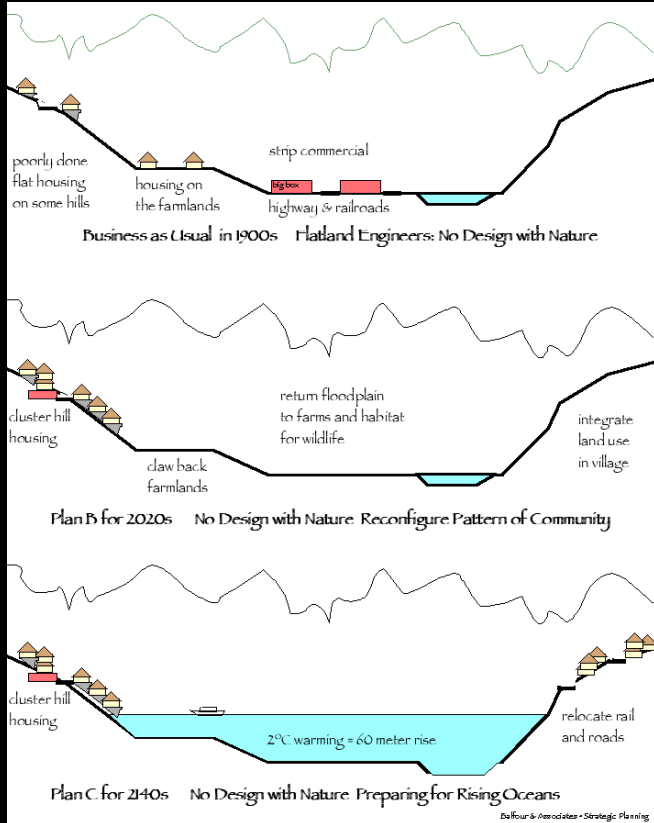


- New Antarctic on Site researchers, more blue lakes, more melt, more subsurface lubrication= accelerating ice sheets sooner than making corrections graph on the right. Ice Sheet Collapse is possible in one century.

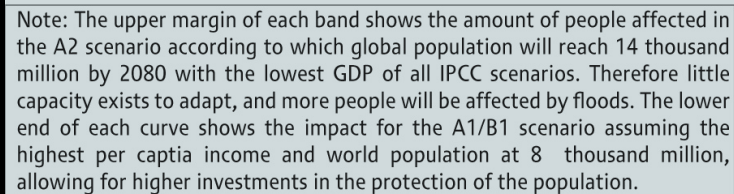
20,000 year history of tides.



BC: mountains as asset, not a barrier.



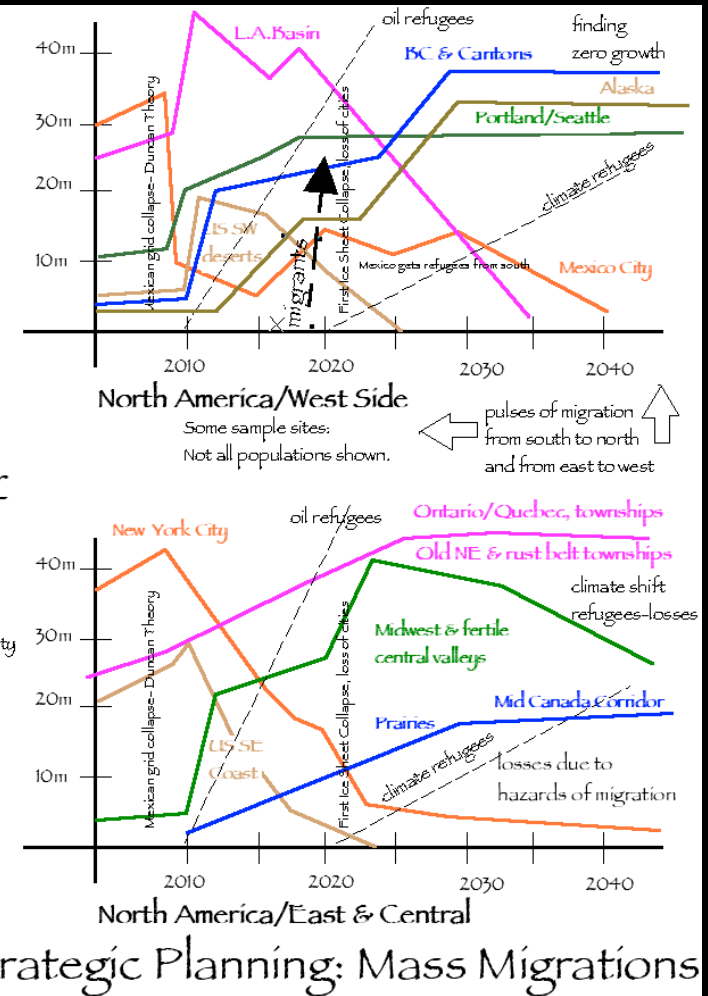
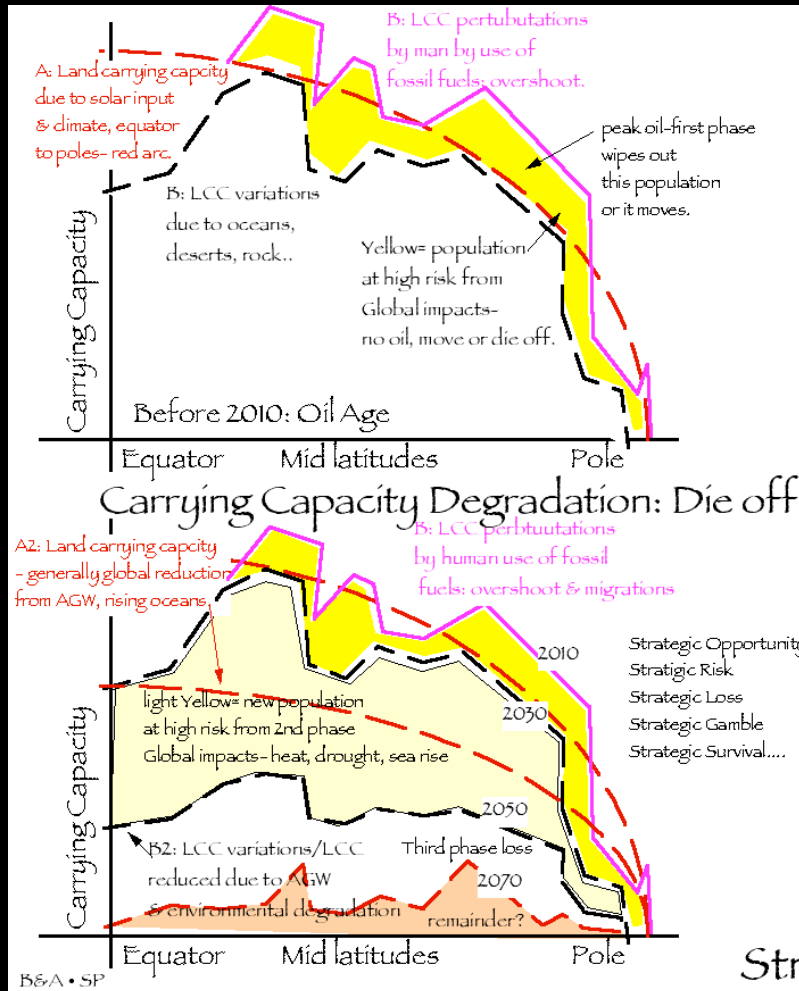
Million people per year (logarithmic scale)



Legacy for your children...



Graphic Impacts



The Big Shift Section B

- 4. De-growth globally a goal but new pressure hits key places, the new Edens of places like BC as an attractant.
- 5. SSP: Urban Cities: rapid and radical change is necessary to make them sustainable: urban triage, marbleization, a shift to rail, sail and trail and away from roads, oil and gas.
- 6. Food & water: critical change as oil inputs drop: oil gave us more food and more people, less oil means less food, less people....
- 7. Migration impacts: scale of this overwhelms all of us.
- 8. Limits to Growth: both globally and locally: ethics & nature.

Rank	Population of city (proper)	Population of metropolitan area ^[31]	Percentage foreign born ^[32]	Expatriate cost of living ^[19]	Metro systems by annual passenger ridership	Top 10 metro systems by the route length	Annual airport traffic by passenger ^[33]	Number of billionaires (U.S. dollars) ^[34]	Gross Metropolitan Product at PPPs (Total output; not per capita) ^[35]
1	Mumbai	Tokyo	Dubai	Tokyo	Tokyo	London	London (5 airports)	New York City	Tokyo
2	Shanghai	Seoul	Miami	Osaka	Moscow	New York City	New York City (3 airports)	London	New York City
3	Karachi	Mexico City	Amsterdam	Moscow	New York City	Berlin	Tokyo (2 airports)	Moscow	Los Angeles
4	Delhi	New York City	Toronto	Geneva	Seoul	Madrid	Atlanta	Hong Kong	Chicago
5	Istanbul	Mumbai	Muscat	Hong Kong	Mexico City	Moscow	Chicago (2 airports)	Los Angeles	Paris
6	São Paulo	Jakarta	Vancouver	Zürich	Paris	Seoul	Paris (2 airports)	Dallas	London
7	Moscow	Sao Paolo	Auckland	Copenhagen	Hong Kong	Shanghai	Los Angeles	Istanbul	Osaka
8	Seoul	Delhi	Geneva	New York City	London	Paris	Dallas	San Francisco	Mexico City
9	Beijing	Osaka	Mecca	Beijing	Osaka	Beijing	Frankfurt	Chicago, Mumbai, São Paulo, Tokyo	Philadelphia
10	Mexico City	Shanghai	The Hague	Singapore	São Paulo	Tokyo	Beijing	n/a	Washington, D.C.

Death of Alpha Cities...

unavoidable

Part B: Community Policy

- Urban: de-growth needed to make the city survivable: largest cities cannot be sustained or continued as they cannot be serviced from a distance. Or introduction of new urban villages and Green Fingers of farm as Detroit is now restructuring as a post oil city.
- Rural outgrowth of some kind is needed and necessary even for stopgap measure: a doubling of BC farmland beyond the ALR and a new Homestead Act to make this happen.

...unavoidable steps in change to adapt.

CANADA

Canton Reform

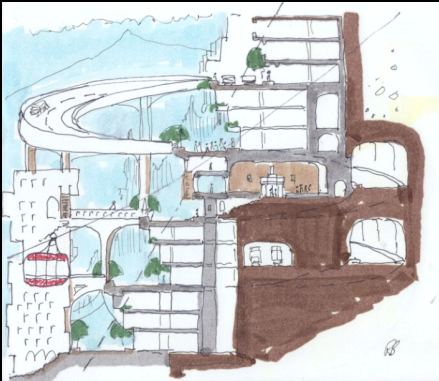
Rural, Urban & Village Policies

- pro-farm policies
- less taxation
- favour family/village scale
- decentralize farming
- lessen monocultures
- traditional modes/energy
- aid in urban triage
- recover good soils lost
- favour family/village scale
- make urban farming
- aid marbelization/ green fingers
- traditional modes/energy
- new village pattern support/ rail transport
- aid localization moves
- favour family/village scale
- traditional industry!
- maintain communications
- traditional transport



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Balfour + Company • Architect
2010 St. John's, Vancouver, B.C. V6Z 2R8 T: (604) 771-0222 Fax: (604) 771-0222
Email: balfour@balfour.ca balfour@balfour.ca Planning, Architecture, Urban Design, Transportation

Part C: Applied Science Now

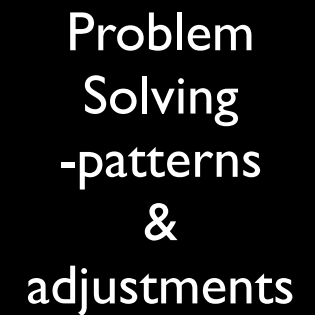


- 10. New patterns of community at every scale: a downscaling for re-localization of production and social networks; homesteads, hamlets and villages to provide half the population another chance, access to land even though this is a modified lifestyle. Canton governance of eco basins in BC.
- 11. Canton assessment, a Design with Nature exercise leads the way into new settlement and farming and avoidance of NO GO zones.
- 12. Not a development plan but a relearning of Old World patterns and a more non-planned and evolutionary cultural landscape.
- 13. New Homesteads are a social network, and interdependence model. (Ostrum, Nobel Peace Prize, Economics.) Images of farm, hamlet & village.



-
- A wide-angle landscape photograph taken from a high vantage point on a snow-covered mountain. In the immediate foreground, a steep, white snow slope descends towards the left, dotted with small, dark evergreen trees. Below the snow, a deep valley unfolds, featuring a winding river that snakes through a patchwork of green fields and dark forests. In the far distance, a large, calm lake is nestled between two mountain ranges. The background is dominated by majestic, rugged mountains with significant snow cover, their peaks partially hidden by soft, white clouds. The sky above is a clear, pale blue, with a few wispy clouds near the horizon. The overall scene conveys a sense of vastness and tranquility in a high-altitude environment.

NOT sustainable



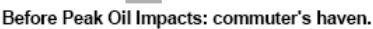
-can be overly prescriptive?

- more energy in analysis than of benefit?

- may preclude just good design & common sense?

-still worth exploring as a pattern language tool, developing methodology-
(within limits).

Deconstruction of Suburbia



First stages of transition: missing teeth become gardens. Houses moved to free lots and infill of some lots to create village clusters in the new green commons.

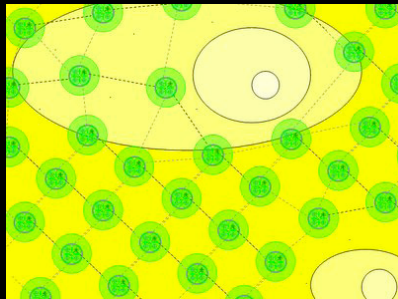
Sustainable forms captured; farmland for food, clustering of buildings to save energy, creation of community feeling and village spaces, addition of missing land uses to complete the village.

Managing the Death of Suburbia: Reclaiming Green Fingers: Turning the remainder housing into the Village

Re-Learning Old World Lessons



Town Edge: not more suburbs but new Village, farm & forest



"A Theory of Power", by Jeff Vail. An exploration of the development and structure of hierarchy and empire through political anthropology, economic theory, evolutionary ontogeny and developmental psychology.

Triage Planning for
Post Oil Society
& Climate Change

You

Families

Buildings

Community Pattern
&

Food

All you take for
granted is not
going to change

Triage Planning for
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Strategic Program for Canton/Regional Food Security
For current population, and for Mass Migration Scenarios.

- to 35 Million high end, hard landing crisis,
- 17 million soft landing limit
- less than one million idealized, limit to growth.

- A ~ current food production at 50%
- B~ possible 95%, historic, 1990 food production with greenhouse use, soil enhancement & urban farming phase I.
- C ~ new cold crop make up in diet
- D~ New local food processing
- E~ new local food storage capacity
- F~ Niche farms, new soils, new grazing lands (Norse Diet restoration)
- G Big scale soils enhancement,
- H1: grains to local crops, (Urals Diet)
- H2: Homestead Act topping up food capacity.

2010 LIMITS & BC POPULATION 3.5 Million

A: Current local food production BC= 50% of need.
A capacity as portion of future needs: 10%
Conclusion, BC food production has to expand by 10X.

- Production factors for increase: high target: 100x
- Intensification of crops: 20x
- New farms beyond ALR- 2x farm areas
- New grazing from forest loss: 2x
- Human Labour restored: 2x to 4x
- Biochar/soil enhancement: 4x
- Water management localized: 2x to 4x
- Urban farming: unknown factor depending on changes to pattern of community.

J F M A M J J A S O N D

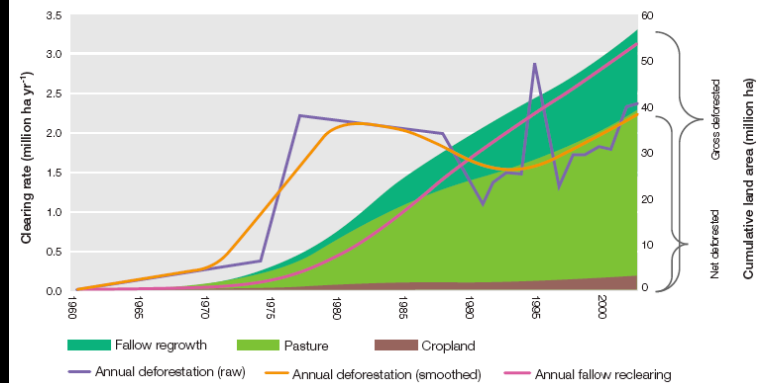
$$\frac{\text{A to H2 is food expansion total for current plus immigrant population}}{\text{A= current food production feeding half of current population}} = f10$$

B&A • Strategic Planning

Overshoot Risk: BC

← Extremes tested and found wanting:
BC as a New Eden
or a last lifeboat Scenario.

Figure 7. Deforestation and fallow reclearing rates in the legal Amazon from 1961–2003.



Deforestation and fallow reclearing rates in the legal Amazon from 1961–2003 (primary y-axis); and land-cover transitions following deforestation estimated by a Markov transition model (cumulative values shown on secondary y-axis). Divide by a factor of 100 to get M km². Taken from (Ramankutty *et al.*, 2007)

Amazon example: deforestation ↗

Cantons: Eco-basin renewed local governance.



Re-localization affecting governance.

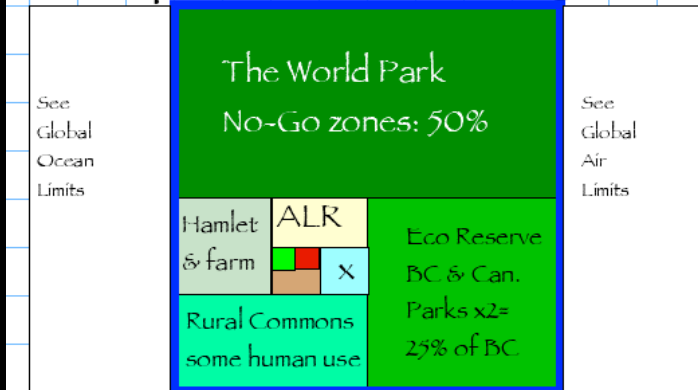


Homesteads: 9% of BC →



Human Settlement North America.

Global Impacts: land controls for Triage Planning.



See migration controls.

Blue Square = BC before rising oceans.

- No-Go zones/World Parks 50%- federal controls.
- Eco-reserve II - 25% limited access- Canton managed.
- Rural Commons 12+% Commons in stewardship
- Hamlet & farm; subsistence farming norm 6%
- ALR Key societies productive farms. 3%
- 'X' factor 1.5%, the loss of land to sea rise.
- 1% urban triage in flux- reversion to half nature
- 1% of urban area marbled in recovery.

Balfour & Associates • Strategic Planning

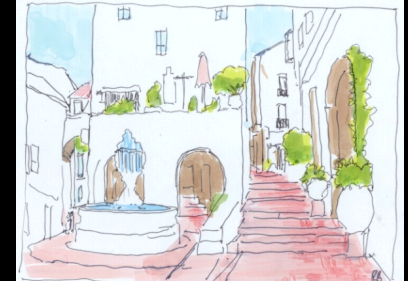


Balfour + Associates • Strategic Planning
Balfour + Company • Architect

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Homesteads, Hamlets & Villages: Adaptive Settlements



- Loss of oil/switch to railway/steam power (wood fuels)
- Downscale of cities/new sustainable towns on rail lines
- New rail lines to access new belts of farm/town/forest pattern
- Settlements seeking good climate/good soils, water access
- Refugees seeking defensible communities/ new towns & villages
- Rudimentary forms of settlement will be the new norm, not luxury
- Generalists, & few specialists will be needed.
- Relocalization of all industry, not globalization will be unavoidable
- So get used to it and plan for adaption



Hierarchy & matrix Pattern

Scale Plan Populations	Areas
BC Limits 35M population	350,000 sq. Mi.
BC at 2010 3.5 Million	

10 Cantons	Factor 1/10	Factor 1/10
Canton	3.5 Million	35,000 sq. Mi.

	Factor 1/7	Factor 1/10
Valley/City	500,000 pop.	3500 sq.. Mi.

Town 70,000 pop. 350 sq.. Mi.

Village 10,000 pop. 35 sq.. Mi.

Hamlet 200 to 1500 pop. 3.5 sq.. Mi.

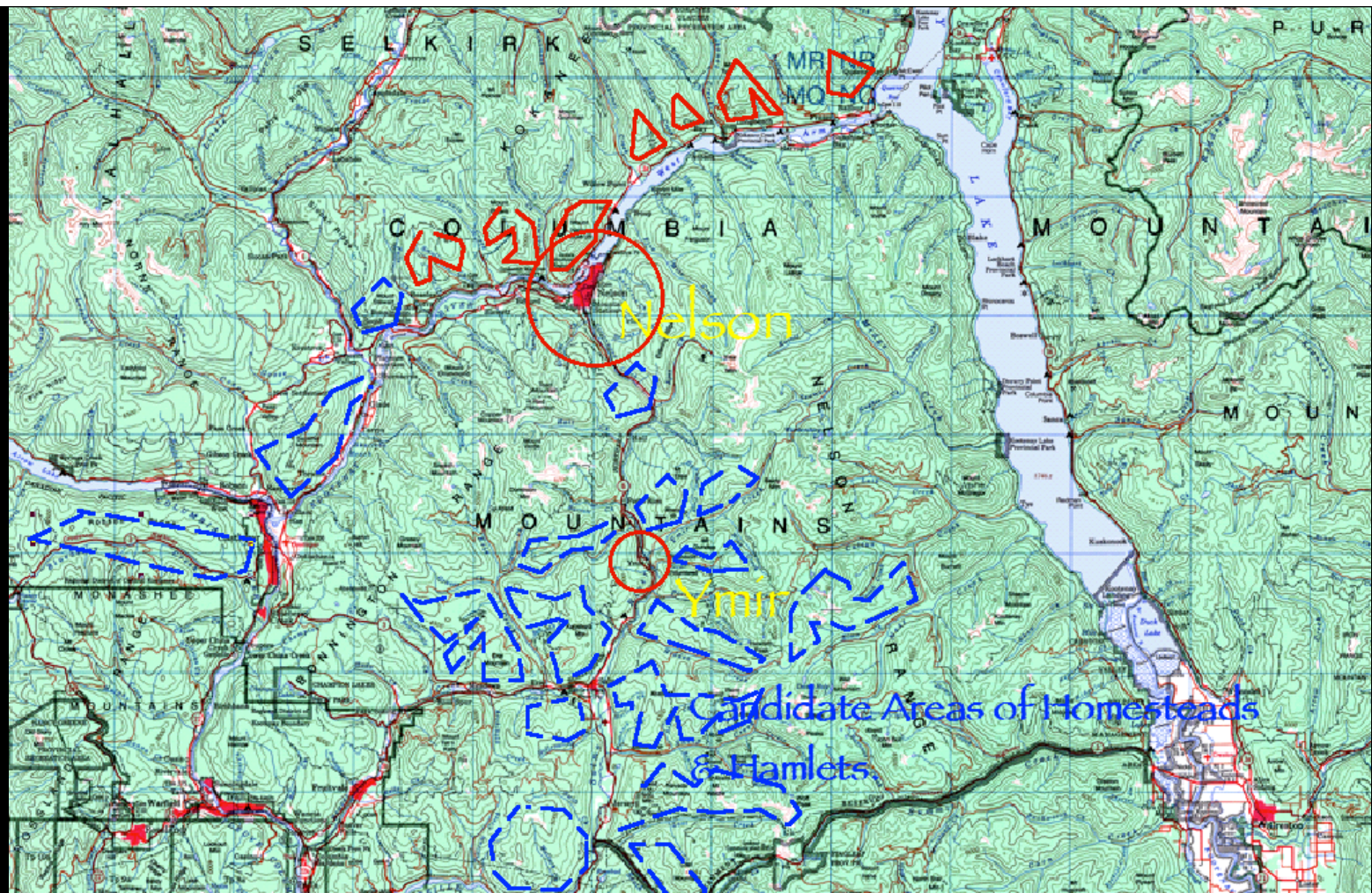
Homestead 30 to 200 pop. 0.35 sq. Mi/ 200 acres

Home-site 4 to 30 people 1 acre net
7 home-site families share in 200 acre homestead
of which half the site is direct farm, half is commons
with some utility; forest and field (grazing),
watercourse protection, habitat for wildlife



What place is Ymir in a post oil resettlement Matrix?

Human community power of 7
Nature Reserves power of 10
Nature doubles reserves at each step in scale.

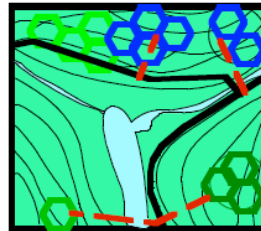
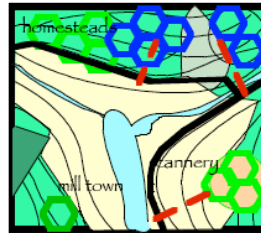
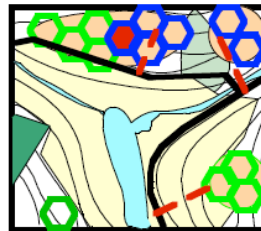
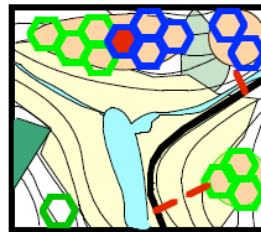
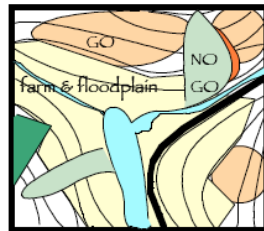


A: Geddes:

A geological map showing a river, lake, and a landslide area labeled 'slide'. The map includes labels for 'bedrock under', 'river', 'lake', and 'slide'. The river is shown as a blue line, the lake as a blue area, and the landslide as an orange area. The bedrock is indicated by a black line. The map also shows a green area on the left and a yellow area on the right.

Assign Exclusion Zones, NO GO zones, unstable slopes, north slopes, habitat, water courses, archeology sites, and set aside all good soils for agriculture including Niche Farm sites on hillsides.

Inclusionary Zones: priority for farm and new settlement in low impact forms.



1. River and rail main lines used for stage one 2010.
2. Local check for water & soils 2012.
3. New main roads put in for hamlets & farms 2013.
4. Homesteads and hamlets established. 2014
5. Evolution of villages, towns, local industry 2016
-- gondolas and new rail spurs added.
6. Third wave migration: 2020, new towns and
triage modification of oil age towns still viable.

Social, economic and ecology mix allows for differentiation, maturation of a few select hill towns on the rail network or on coastal routes.

Rail access stage: hilltowns, 10,000 people.

New Hill Arterials & homesteads: 100,000.

Hamlets, and homesteads: 1,000,000

Villages, hilltowns, gondolas: 10,000,000

Cities: Triage and New towns: 55,000,000 in BC.

H: Evolution of Green Fingers of Sustainability (Balfour, Keenan, Rees). Compaction of our environmental footprint by multi stage retention of green areas at every scale.

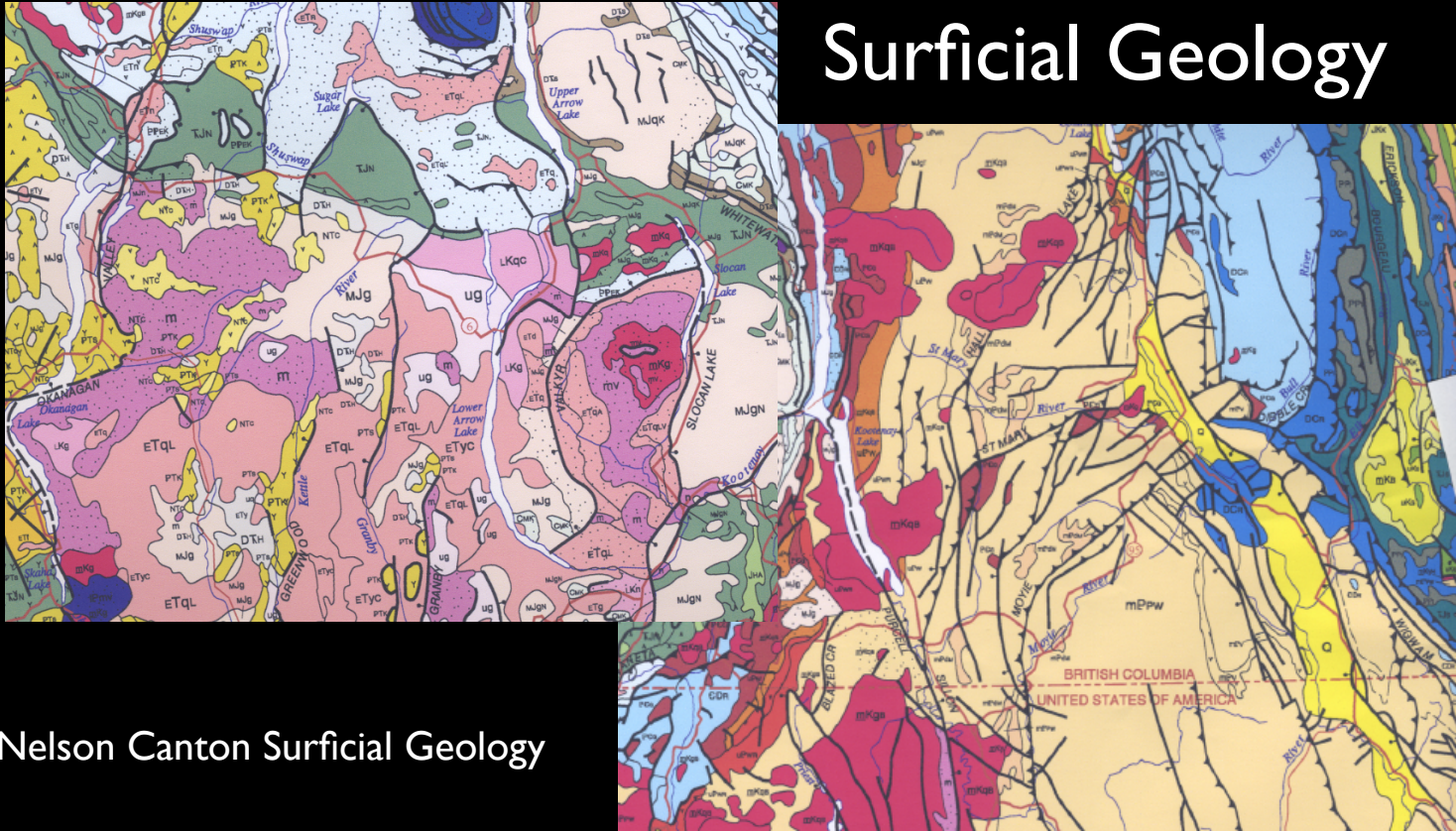
This is not a development programme but an exercise in post oil emergency resettlement with as much preservation of nature as a first goal.

Canton Assessments

Design with Nature

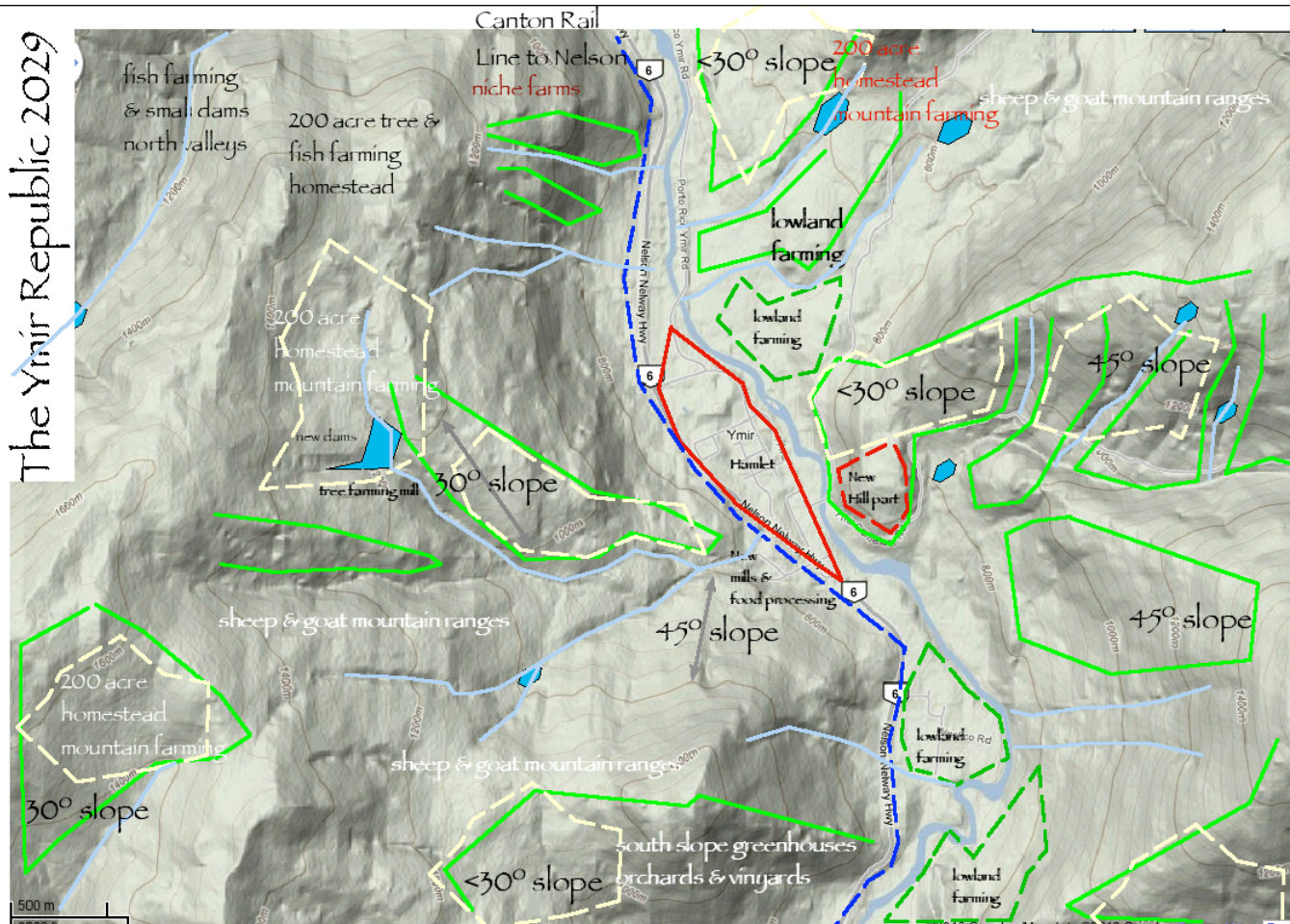
Limits to Growth

Surficial Geology



- Nelson Canton Surficial Geology

The Ymir Republic 2029



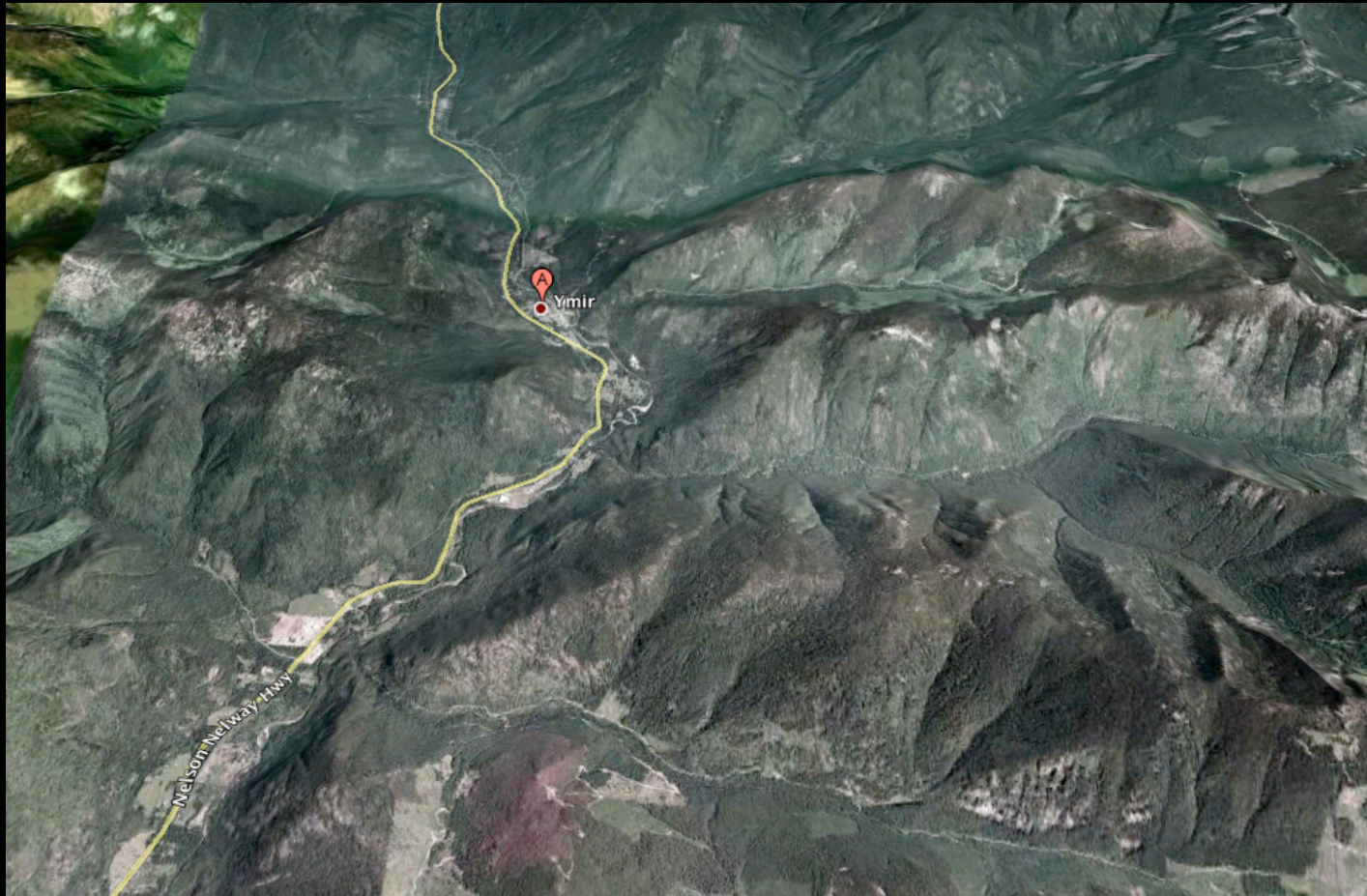
Hamlet of Ymir • Canton of Kootenay

BSA Strategic Planning
BC Food Network Conference 2010

Just one stage of design with nature review & inventory.



Balfour + Associates • Strategic Planning
Balfour + Company • Architect
2010 B.C. Food Network Conference 2010
Food Network Conference 2010
Food Network Conference 2010



Ymir Physical Landscape



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The Ymir Republic 2029: cultural adaptation to the mountains of BC: a typical site for illustration.



Re-assessing the cultural landscape in post oil economy, with climate change and massive population re-settlement.

B&A Strategic Planning 2010

Ymir Cultural Landscape Potentials

Re-settlement Policy.

- Access to land for chance at subsistence farming, for family & friends.
- Urban homesteads: how to make the 40% public lands productive.
- New Homestead Act and rural hamlets: before we need them, now.
- Re-orientation to railways and waterways as highways fall into disuse.
- Planning for evolution, accretion and small scale community change.



Homestead Clusters to Hamlet Scale in Commons



Post oil hamlets: rural independence.

- Use existing rail, waterway and secondary road systems in place.
- Pre-plan to avoid problem areas, seeking out best siting options (Design with Nature exercise.)
- Interdependence of family and community recognized as safeguard to both and increase success of re-localization.



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2010 N. 10th Ave., Suite 100, Anchorage, AK 99503-1000
2010 N. 10th Ave., Suite 100, Anchorage, AK 99503-1000

Avoidance: Not Development

- Conditions of Homestead and hamlets are based on accepting an alternate standard of living, a new lifestyle and transition to a new economy. Land transferable only via family: birth, death & marriage.
- Homesteads are a group ownership model, with community stewardship of a ring of commons land.
- Nuclear family home and ownership independence happens within the framework of the extended family homestead. The family lot is fee simple within a larger land grant. Abandoned land goes back to crown.
- Clustering of homes and hamlets minimizes impact on the land and increases joint security.

Policy Revolution Needed for Sustainable Community....



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2010 to 2011, 2012 to 2013, 2014 to 2015, 2016 to 2017, 2018 to 2019, 2020 to 2021, 2022 to 2023, 2024 to 2025, 2026 to 2027, 2028 to 2029, 2030 to 2031, 2032 to 2033, 2034 to 2035, 2036 to 2037, 2038 to 2039, 2040 to 2041, 2042 to 2043, 2044 to 2045, 2046 to 2047, 2048 to 2049, 2050 to 2051, 2052 to 2053, 2054 to 2055, 2056 to 2057, 2058 to 2059, 2060 to 2061, 2062 to 2063, 2064 to 2065, 2066 to 2067, 2068 to 2069, 2070 to 2071, 2072 to 2073, 2074 to 2075, 2076 to 2077, 2078 to 2079, 2080 to 2081, 2082 to 2083, 2084 to 2085, 2086 to 2087, 2088 to 2089, 2090 to 2091, 2092 to 2093, 2094 to 2095, 2096 to 2097, 2098 to 2099, 2100 to 2101, 2102 to 2103, 2104 to 2105, 2106 to 2107, 2108 to 2109, 2110 to 2111, 2112 to 2113, 2114 to 2115, 2116 to 2117, 2118 to 2119, 2120 to 2121, 2122 to 2123, 2124 to 2125, 2126 to 2127, 2128 to 2129, 2130 to 2131, 2132 to 2133, 2134 to 2135, 2136 to 2137, 2138 to 2139, 2140 to 2141, 2142 to 2143, 2144 to 2145, 2146 to 2147, 2148 to 2149, 2150 to 2151, 2152 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Niche farms phase I

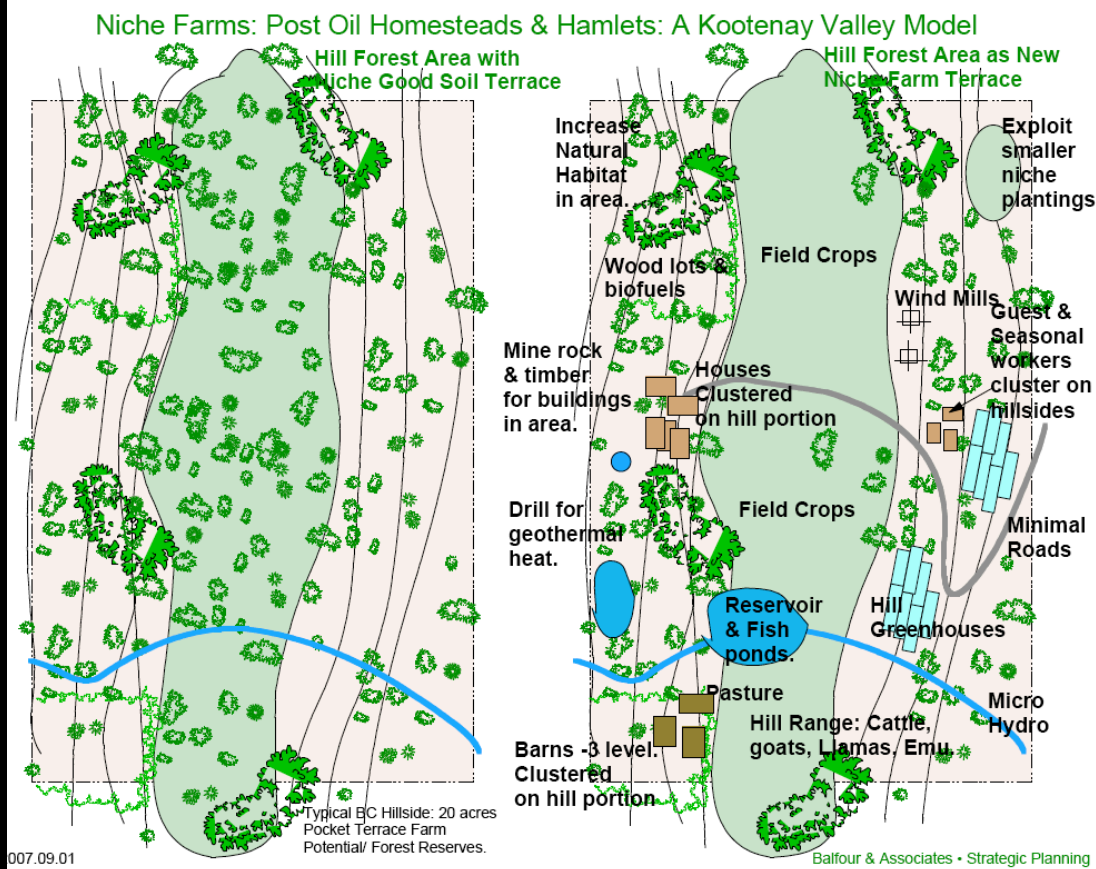
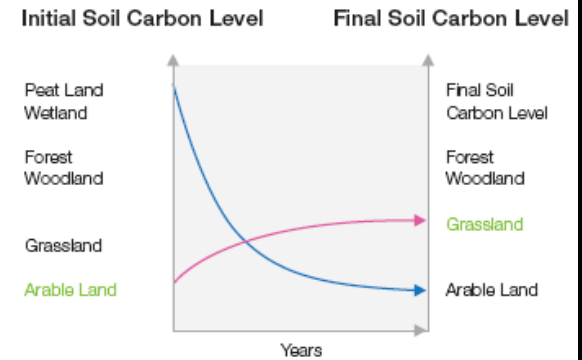


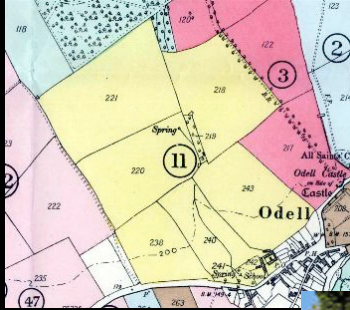
Figure 5. Changes in carbon stock from peat land to arable land and from arable land to grassland.



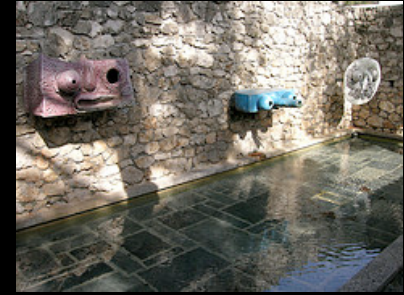
Changes in carbon stock from peat land to arable land (red/dark line) and from arable land to grassland (blue/light line). Each Eco-system and agro-forestry management crop system has a soil carbon equilibrium. Time constant of exponential change depends on climate change but averages around 33 years (see Table 5 for range of values). Source: IPCC 2001.

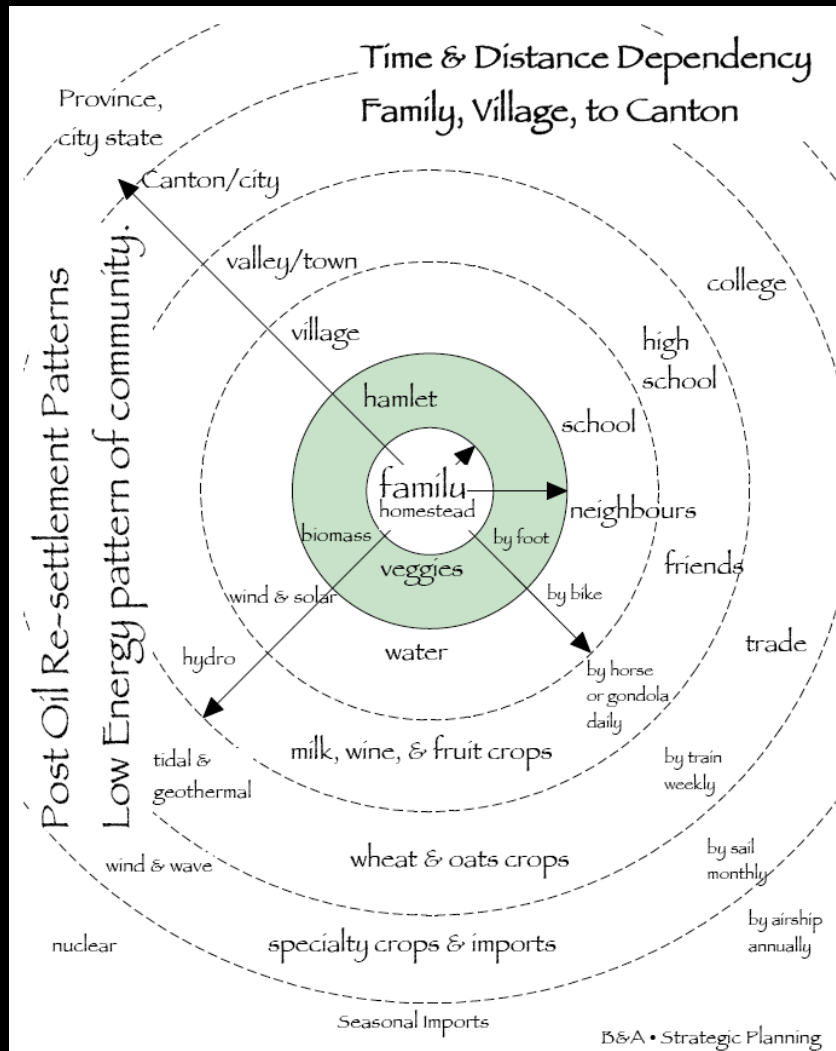
Bio-char needed for northern lands...

The Homestead



transition
design for oil
age first wave.





The Hierarchy of Community

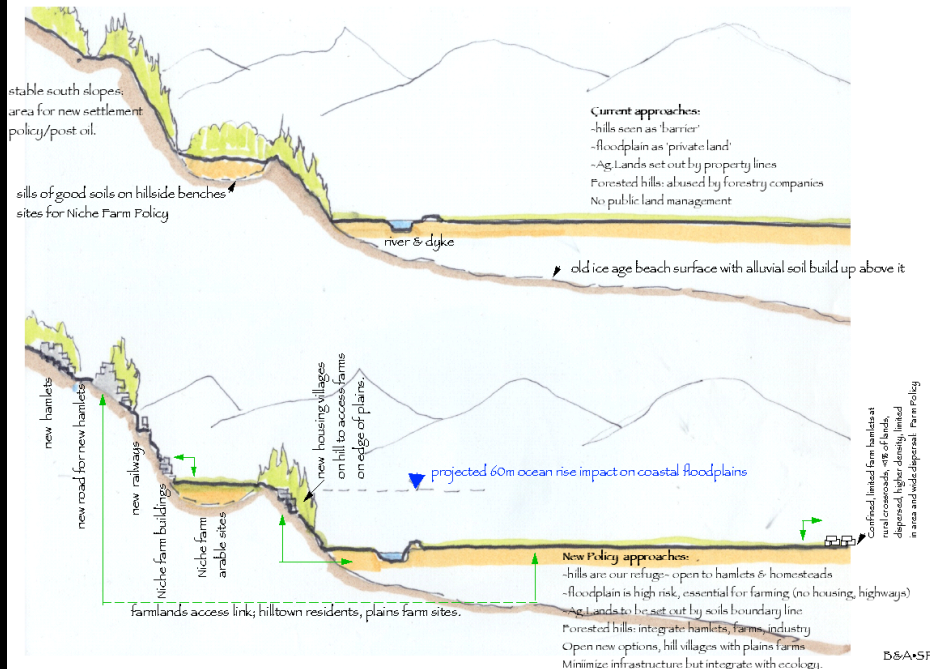


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The Hilltowns Post Oil

Attitudes to Land & Post Oil land conservation.



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2013-14-15, 2015-16-17, 2017-18-19, 2020-21, 2022-23, 2024-25, 2026-27, 2028-29, 2030-31, 2032-33, 2034-35, 2036-37, 2038-39, 2040-41, 2042-43, 2044-45, 2046-47, 2048-49, 2050-51, 2052-53, 2054-55, 2056-57, 2058-59, 2060-61, 2062-63, 2064-65, 2066-67, 2068-69, 2070-71, 2072-73, 2074-75, 2076-77, 2078-79, 2080-81, 2082-83, 2084-85, 2086-87, 2088-89, 2090-91, 2092-93, 2094-95, 2096-97, 2098-99, 2100-01, 2102-03, 2104-05, 2106-07, 2108-09, 2110-11, 2112-13, 2114-15, 2116-17, 2118-19, 2120-21, 2122-23, 2124-25, 2126-27, 2128-29, 2130-31, 2132-33, 2134-35, 2136-37, 2138-39, 2140-41, 2142-43, 2144-45, 2146-47, 2148-49, 2150-51, 2152-53, 2154-55, 2156-57, 2158-59, 2160-61, 2162-63, 2164-65, 2166-67, 2168-69, 2170-71, 2172-73, 2174-75, 2176-77, 2178-79, 2180-81, 2182-83, 2184-85, 2186-87, 2188-89, 2190-91, 2192-93, 2194-95, 2196-97, 2198-99, 2200-01, 2202-03, 2204-05, 2206-07, 2208-09, 2210-11, 2212-13, 2214-15, 2216-17, 2218-19, 2220-21, 2222-23, 2224-25, 2226-27, 2228-29, 2230-31, 2232-33, 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Defensible Village

Defensible Farms



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2638 W 14 Ave., Vancouver, B.C. V6K 2B9 T (604) 731-0226 Fax (604) 734-2638
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What new patterns for sustainability?

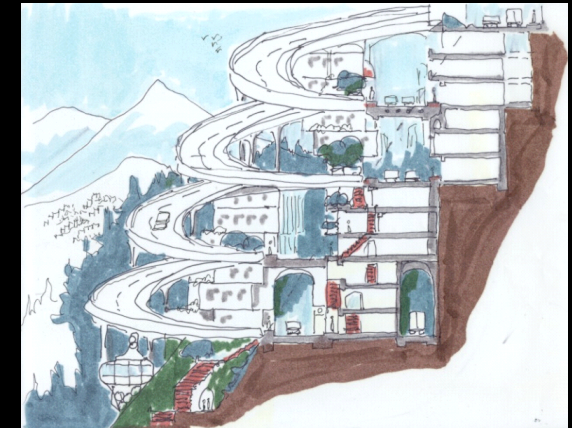
- Loss of large unsustainable city centres (lean market adjustment)
- Marbleization in the suburbs- reclaiming from past mistakes
- new villages rail oriented and eco-basin managed (traditional)
- new northern tier of towns/new rail systems (visionary)
- new energy harvesting (techno-rescues)
- multiple pathways for maximizing food production
- new industries recycling, reusing, co-operative models (old world lessons.)



Scale of Solutions



Big footprint options not possible
 Dispersed villages- need autonomy but cooperation
 Housing clustering: energy & community fixes
 Cooperative local economy vital
 Seasonal survival: a new reality
 Geothermal/earth sheltered towns
 New wood & coal energy base
 Extending growing conditions
 Over-wintering - in crops & greenhouses
 New animal husbandry vital
 Self reliance: good insurance.



Circle the
 wagons
 but let
 people in?

Old & New: alternate histories give more future options.

????????

Re-localization & Sharing



SHIFT NOW

de-growth: an unavoidable part of the solutions
re-directing community form: = interim step

