NATURAL RESILIENCE

SOM

Thriving together with nature, performs better for BOTH normal and emergencies?

More Resilient Humans

More Resilient Humans?

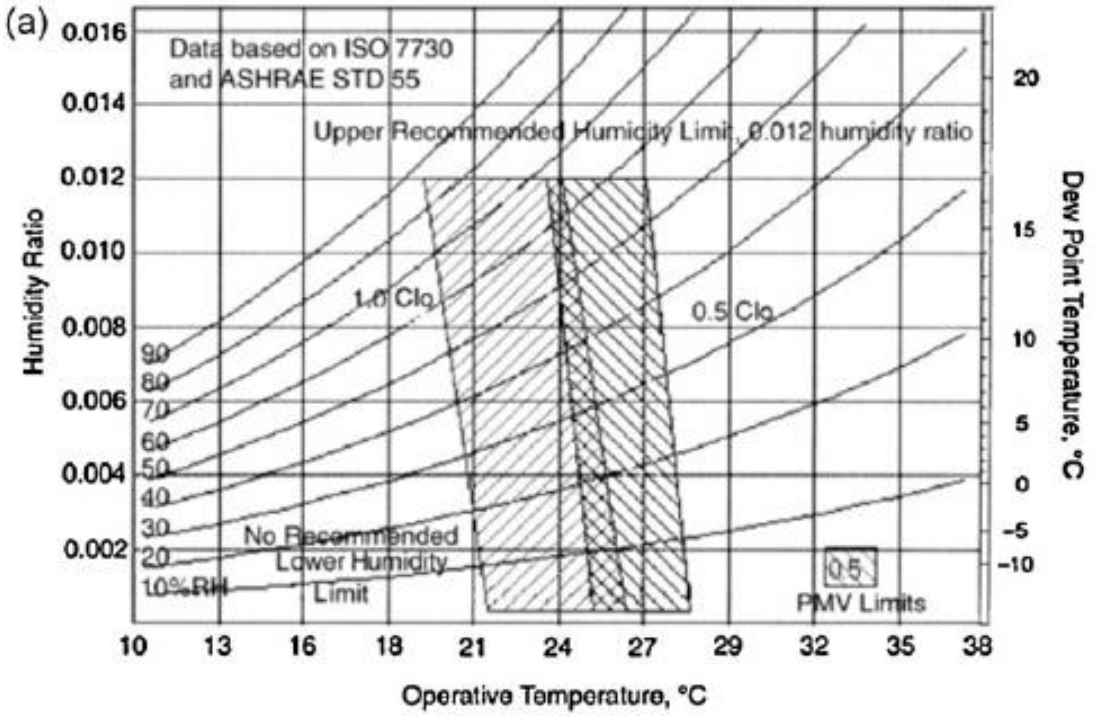
http://www.nbcnews.com/health/health-news/amish-seek-measles-shots-after-ohio-outbreak-sickens-15-n89221

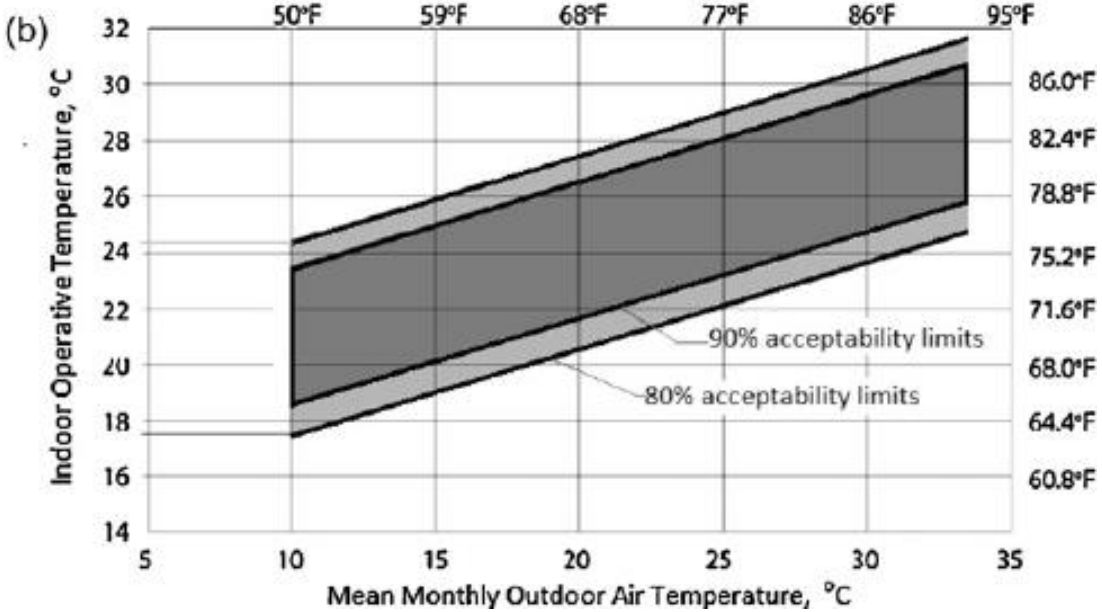
More Resilient Humans?

- 56% of national average in cancer rate
- Almost no obesity , US adults about 35% obese
- 5% kids have Asthma, 9.3% US kids
- 3 cases of Autism, 2 had vaccinations
- Less allergies

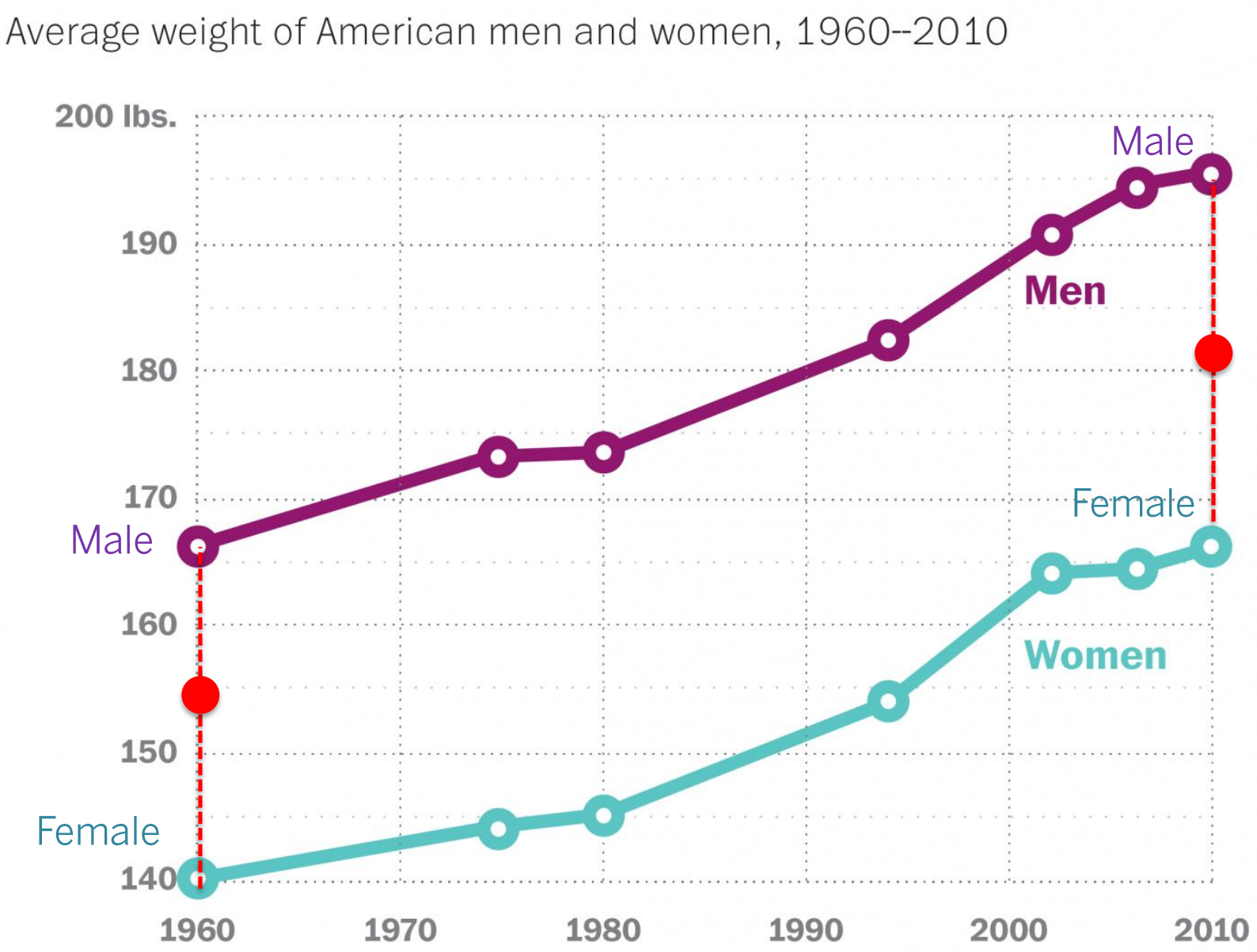
http://www.nbcnews.com/health/health-news/amish-seek-measles-shots-after-ohio-outbreak-sickens-15-n89221

Physical Resilient
Natural Comfort





Physical Resilient
Natural Diet



http://www.huffingtonpost.com/2015/02/12/gut-bacteria-health_n_6480580.html

School kids on Farm 30-50% less chance of asthma

“exposure to bacteria and fungi from environmental sources like dirt and animal hair early in life protects against asthma and allergies by helping the immune system develop normally”

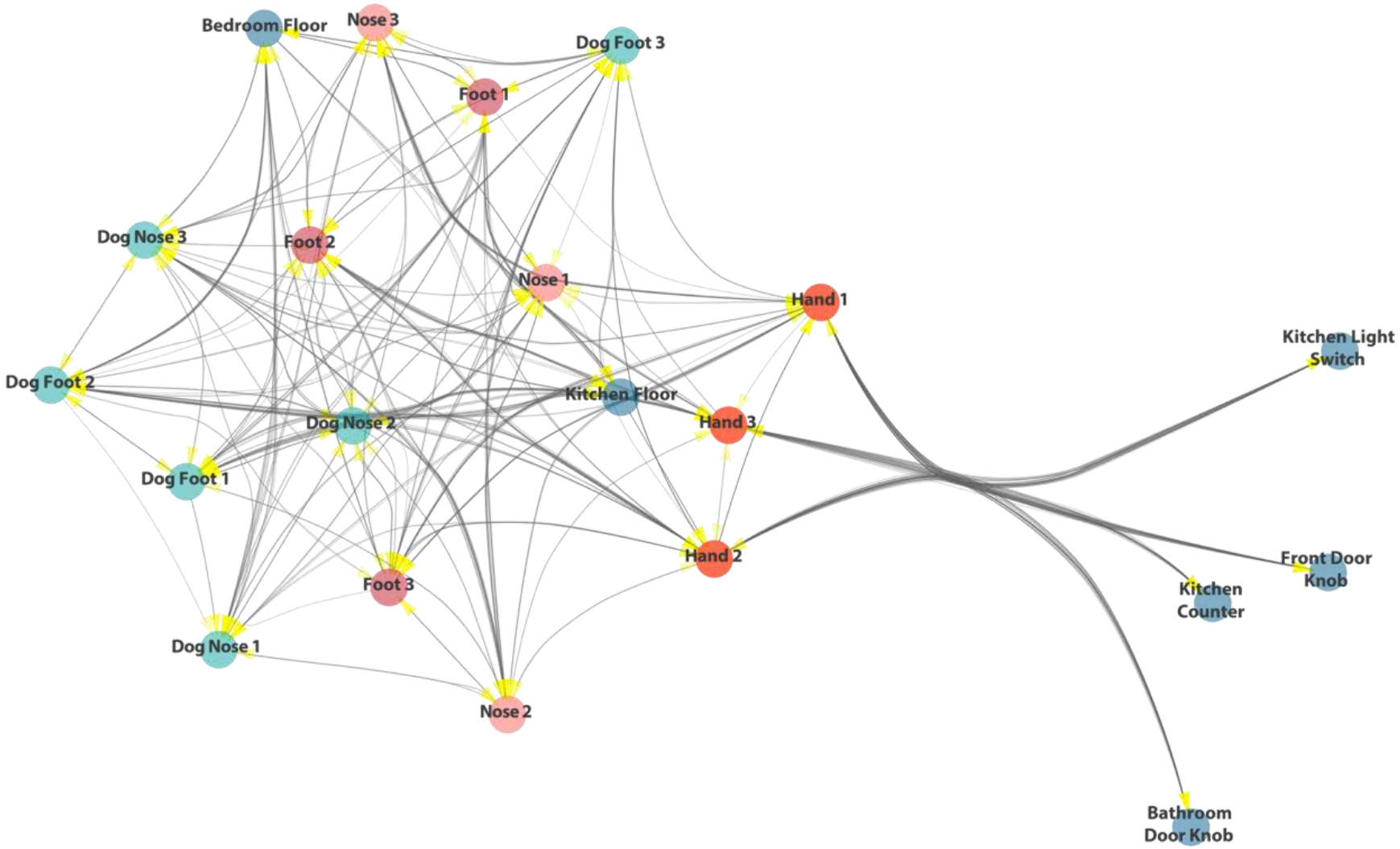
Ege, M.J. *New England Journal of Medicine*, Feb. 24, 2011; vol 364: pp 701-709.

Physical Resilient
Natural Living

Physical Resilient

Natural Living

Movement of bacteria between people, dogs and home surfaces with a dynamic Bayesian network model

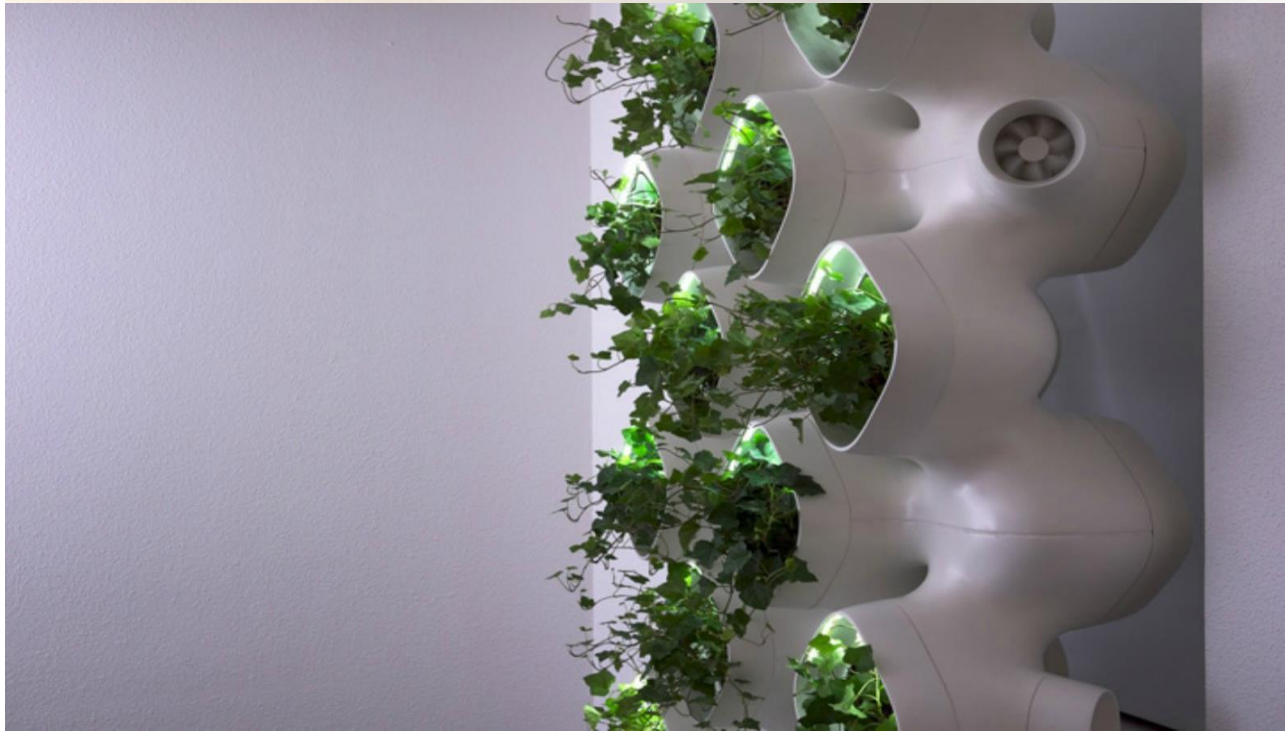


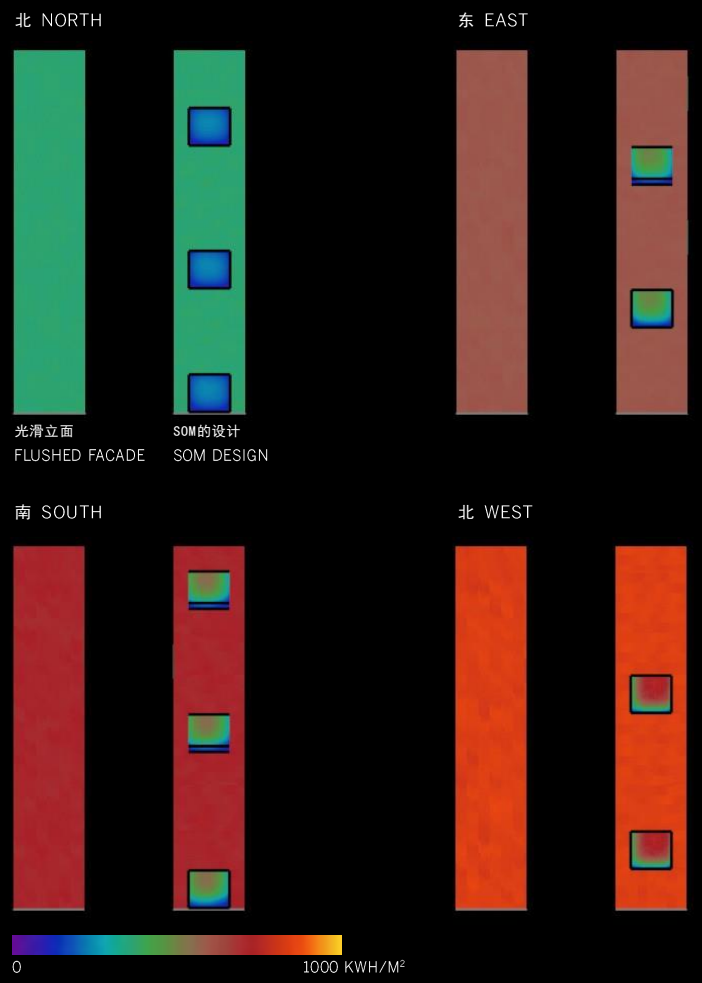
Credit: Argonne

Physical Resilient
Natural Living

More Resilient Buildings

Plants To Clean Air and Provide Oxygen





在立面降低15%的太阳辐射
15% REDUCTION IN SOLAR RADIATION ON FACADE

立面的设计经过对太阳辐射性能的优化。在南昌较为炎热的气候中，如何降低太阳直射是使用空间中的人们舒适度和节能的重要因素。垂直的庭院提供了立面的遮阳，并降低了整个建筑的日照辐射温度，以此为整个建筑提供了较为凉爽的微气候。

The facade design is optimized for solar and glare control. In Nanchang's hot climate, reducing the amount of direct radiation in the occupied space is critical for occupants comfort and energy savings. The vertical courtyards provide shading to the facade and reduce the building's overall mean radiant temperature, ultimately providing a cooler micro-climate around the building.

垂直的庭院为每一层的使用者提供了在空中接近自然，空气以及漫射光的机会 如果气候允许，庭院中的新风系统能够调节由绿色植被带来的新鲜 空气。为使用者提供更好的环境。同时也为真个建筑节省了降温的 费用。

The vertical courtyards provide access to natural diffuse light, vegetation and fresh air eat each floor.

When climate allows, air intakes strategically located within the courtyards and adjacent to vegetation provide minimum filtered fresh air to the occupied space, ultimately saving on cooling and fan energy.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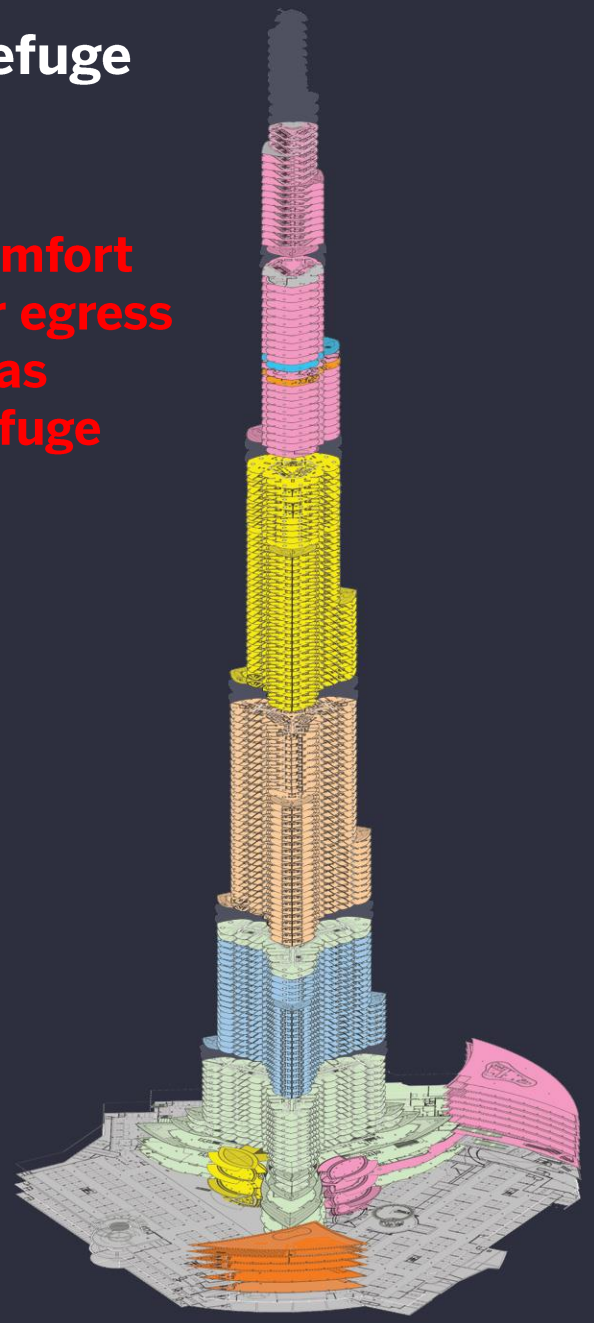
Balconies

Thermal Refuge

Provide comfort cooling for egress AOR , etc. as thermal refuge

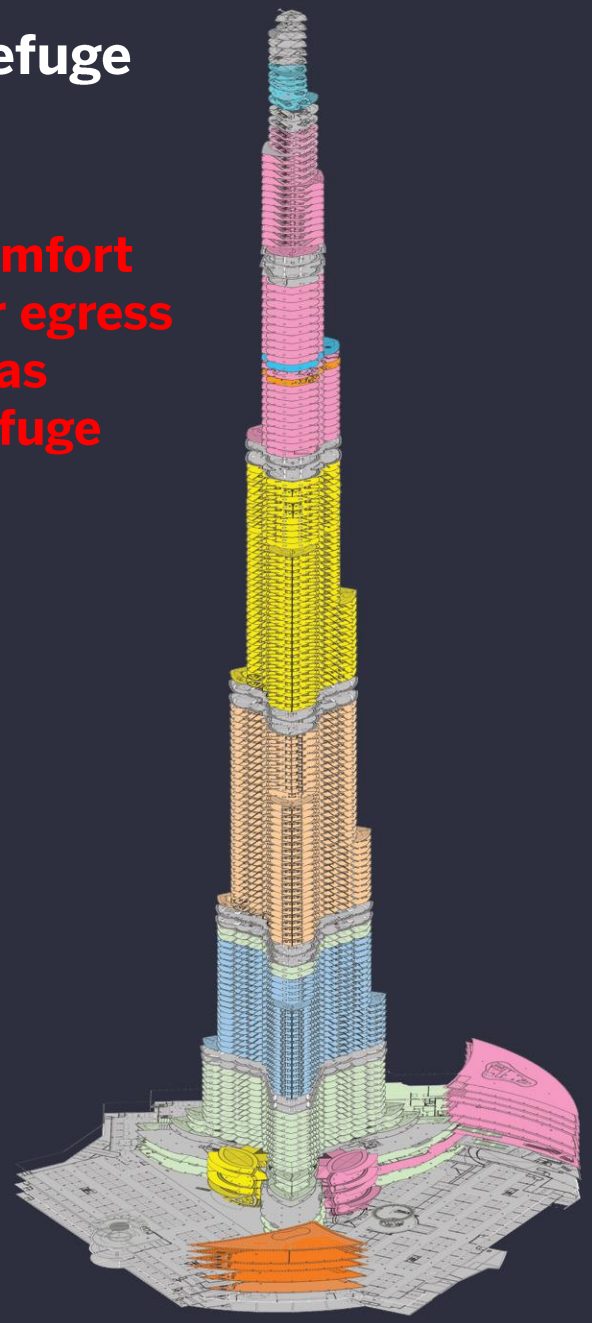


corporate suites

level 154	5 008 sq. ft.	
level 153	5 008 sq. ft.	
level 152	5 008 sq. ft.	
level 151	6 026 sq. ft.	
level 150	6 026 sq. ft.	
level 149	6 026 sq. ft.	
level 148	6 026 sq. ft.	
level 147	7 044 sq. ft.	
level 146	7 044 sq. ft.	
level 145	7 044 sq. ft.	
level 144	7 044 sq. ft.	
level 143	8 061 sq. ft.	
level 142	8 061 sq. ft.	
level 141	8 061 sq. ft.	
level 140	7 609 sq. ft.	
level 139	7 609 sq. ft.	
level 135	10 788 sq. ft.	
level 134	10 788 sq. ft.	
level 133	10 788 sq. ft.	
level 132	10 788 sq. ft.	
level 131	10 788 sq. ft.	
level 130	10 788 sq. ft.	
level 129	10 788 sq. ft.	
level 128	10 788 sq. ft.	
level 127	10 788 sq. ft.	
level 126	10 788 sq. ft.	
level 125	10 788 sq. ft.	
level 124	10 788 sq. ft.	observatory
level 123	13 515 sq. ft	corporate suites sky lobby / bistro
level 122	13 515 sq. ft	resident's club / hotel club
level 121	13 515 sq. ft	
level 120	13 515 sq. ft	
level 119	13 515 sq. ft	
level 118	13 515 sq. ft	
level 117	13 515 sq. ft	
level 116	13 515 sq. ft	
level 115	13 515 sq. ft	
level 114	13 515 sq. ft	
level 113	13 515 sq. ft	
level 112	13 515 sq. ft	

Thermal Refuge

Provide comfort cooling for egress AOR , etc. as thermal refuge



mechanical

	roof 1	
	lvl 160 up mezz 3	
	level 160 mezz 3	
	level 160 mezz 2	
	level 160 mezz 1	
	level 160	3 250 sq. ft.
communications	level 159	3 250 sq. ft.
communications	level 158 inter	
communications	level 158	4 129 sq. ft.
communications	level 157	4 129 sq. ft.
communications	level 156	4 129 sq. ft.
	level 155 inter.	
	level 155	5 008 sq. ft.
	level 138	10 788 sq. ft.
	level 137	344 sq. ft.
	level 136	10 788 sq. ft.
	level 111	16 241 sq. ft.
	level 110	207 sq. ft.
	level 109	16 241 sq. ft.

level 75	23 189 sq. ft.
level 74	438 sq. ft.
level 73	23 189 sq. ft.
level 42	28 673 sq. ft.
level 41	1 004 sq. ft.
level 40	28 673 sq. ft.
level 18	33 607 sq. ft.
level 17	33 607 sq. ft.
level 4	21 862 sq. ft.
level 2	32 291 sq. ft.

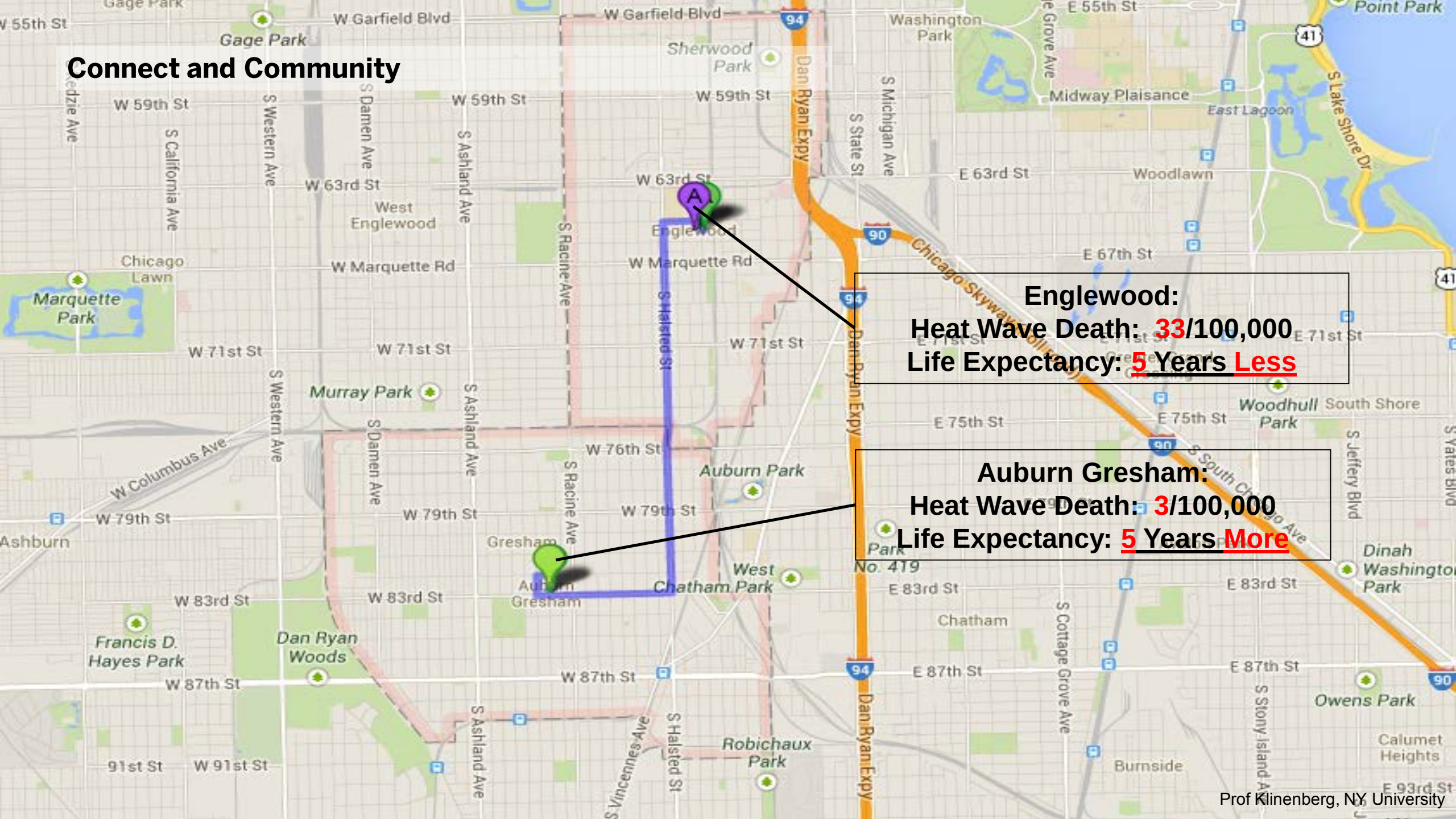
Occupants Control to Access Light and Air

http://onlinelibrary.wiley.com/doi/1

Space with Nature to Connect

http://onlinelibrary.wiley.com/doi/10.1002/brb3.322/full

Connect and Community



Prof Klinenberg, NY University

More Resilient Planet

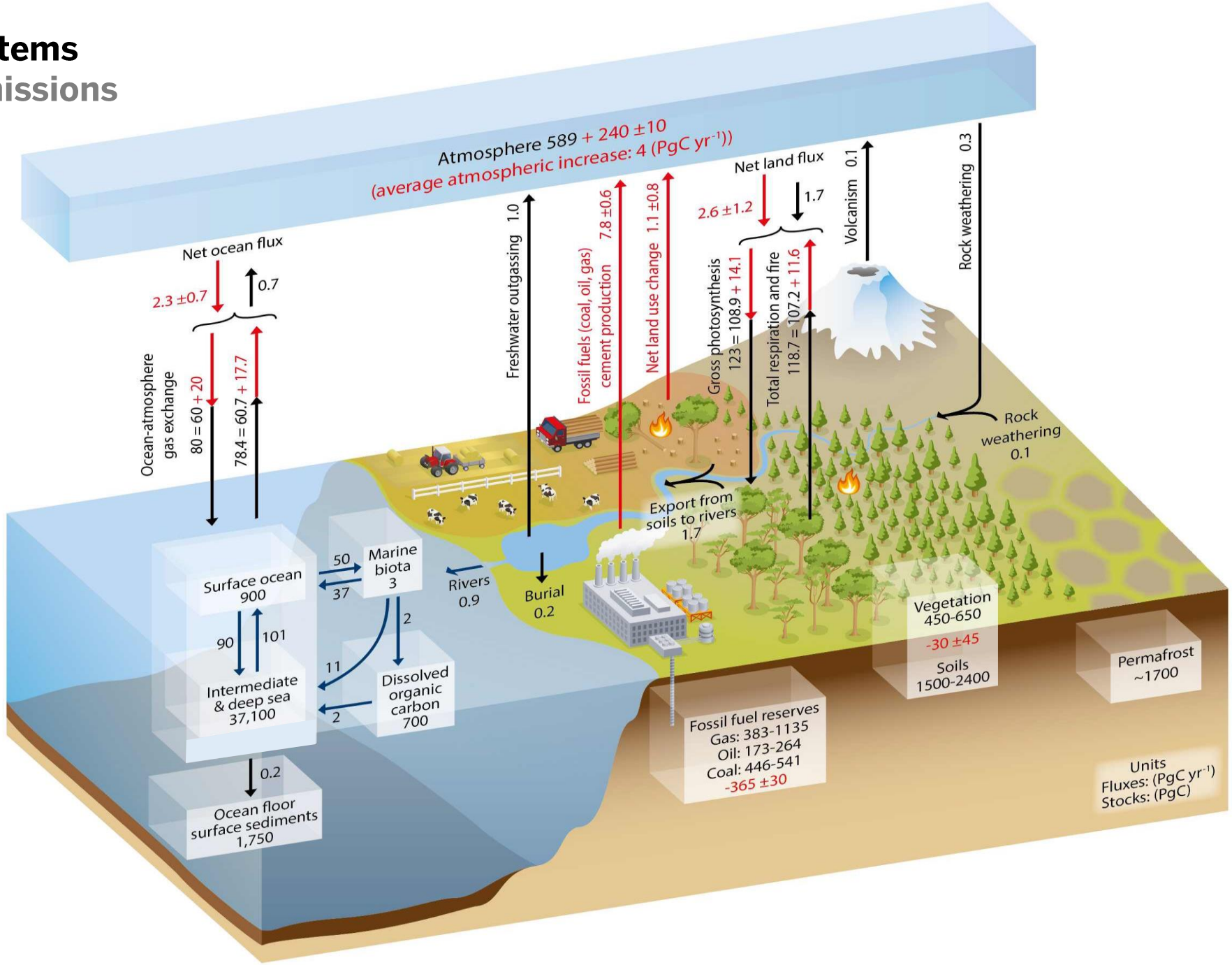
Coastal ecologies

Agricultural ecologies

Freshwater ecologies

Terrestrial ecologies

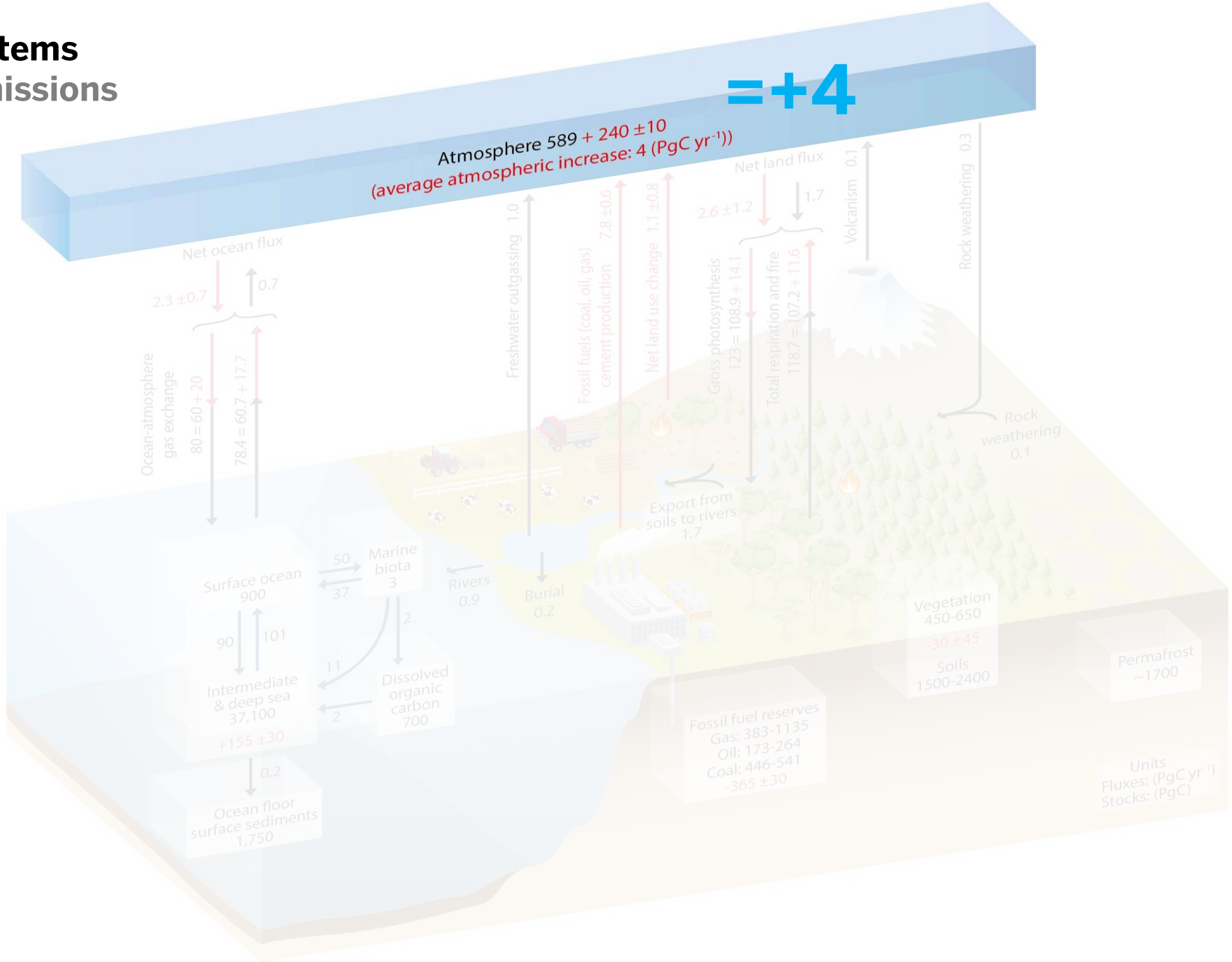
Terrestrial and Marine Ecosystems
Absorb Half of the Carbon Emissions



PgC yr $^{-1}$ = 1,000,000,000 Tons Carbon/Year

IPCC

Terrestrial and Marine Ecosystems
Absorb Half of the Carbon Emissions



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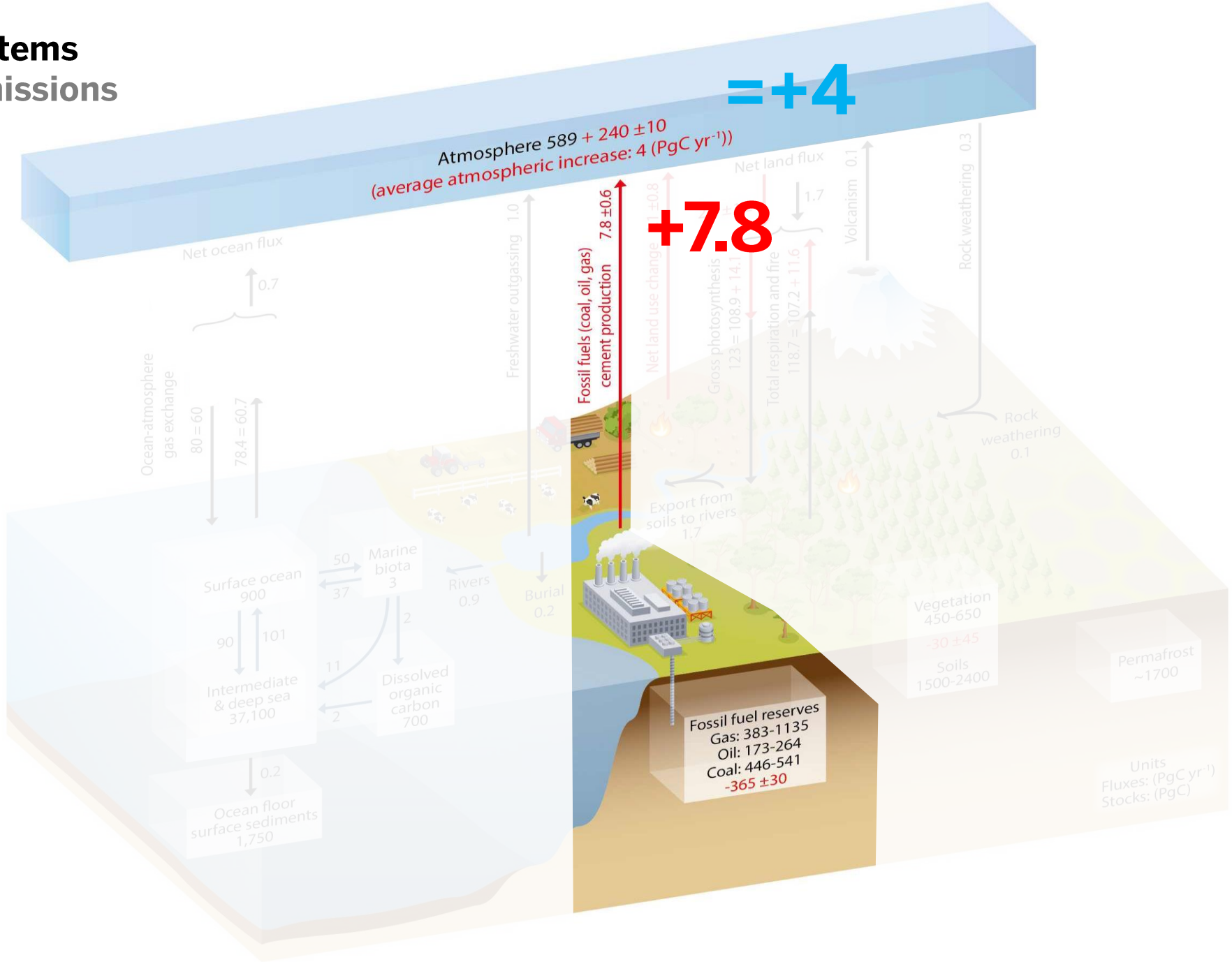
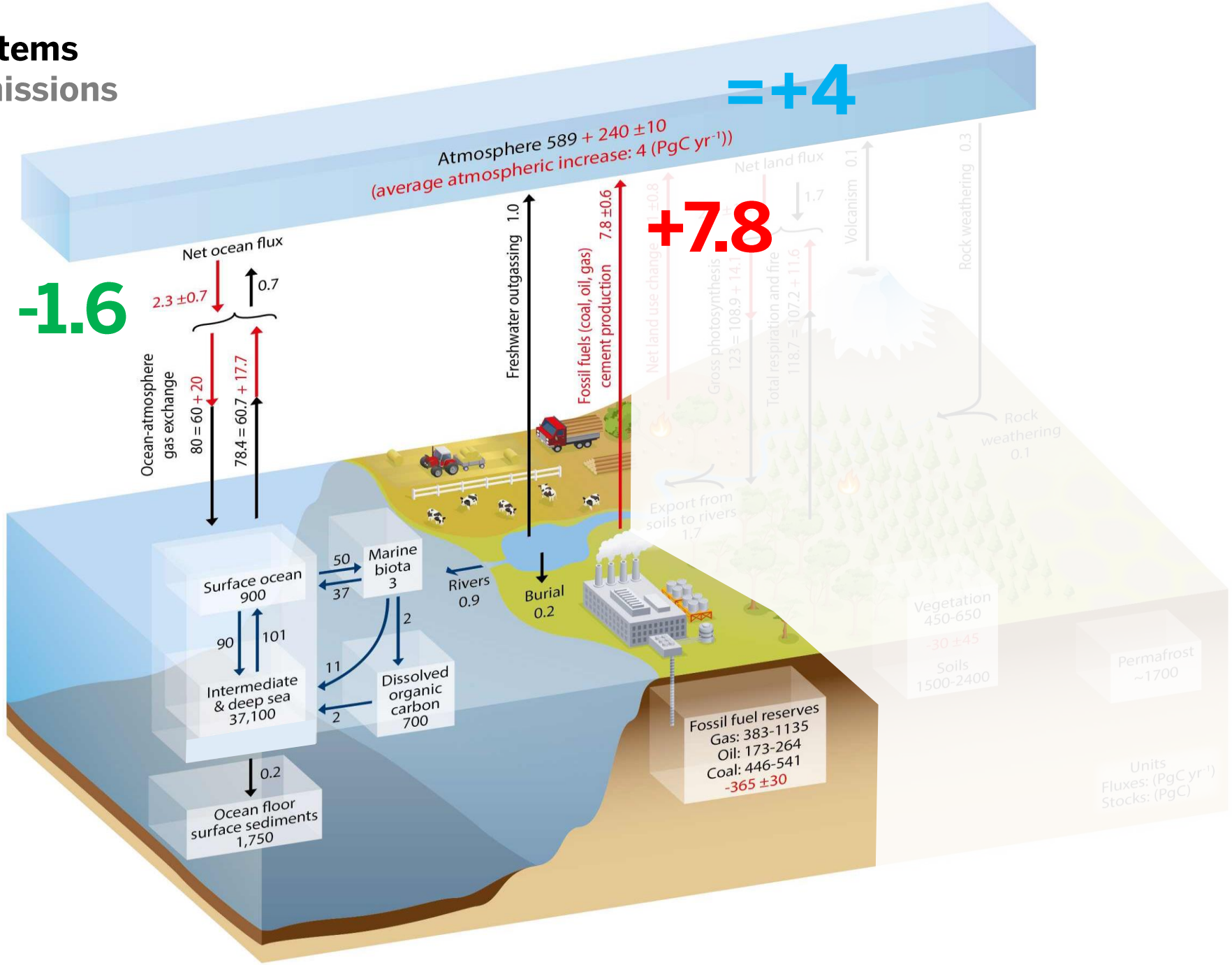


PgC yr $^{-1}$ **= 1,000,000,000 Tons Carbon/Year**

IPCC

Terrestrial and Marine Ecosystems
Absorb Half of the Carbon Emissions



PgC yr $^{-1}$ **= 1,000,000,000 Tons Carbon/Year**

IPCC

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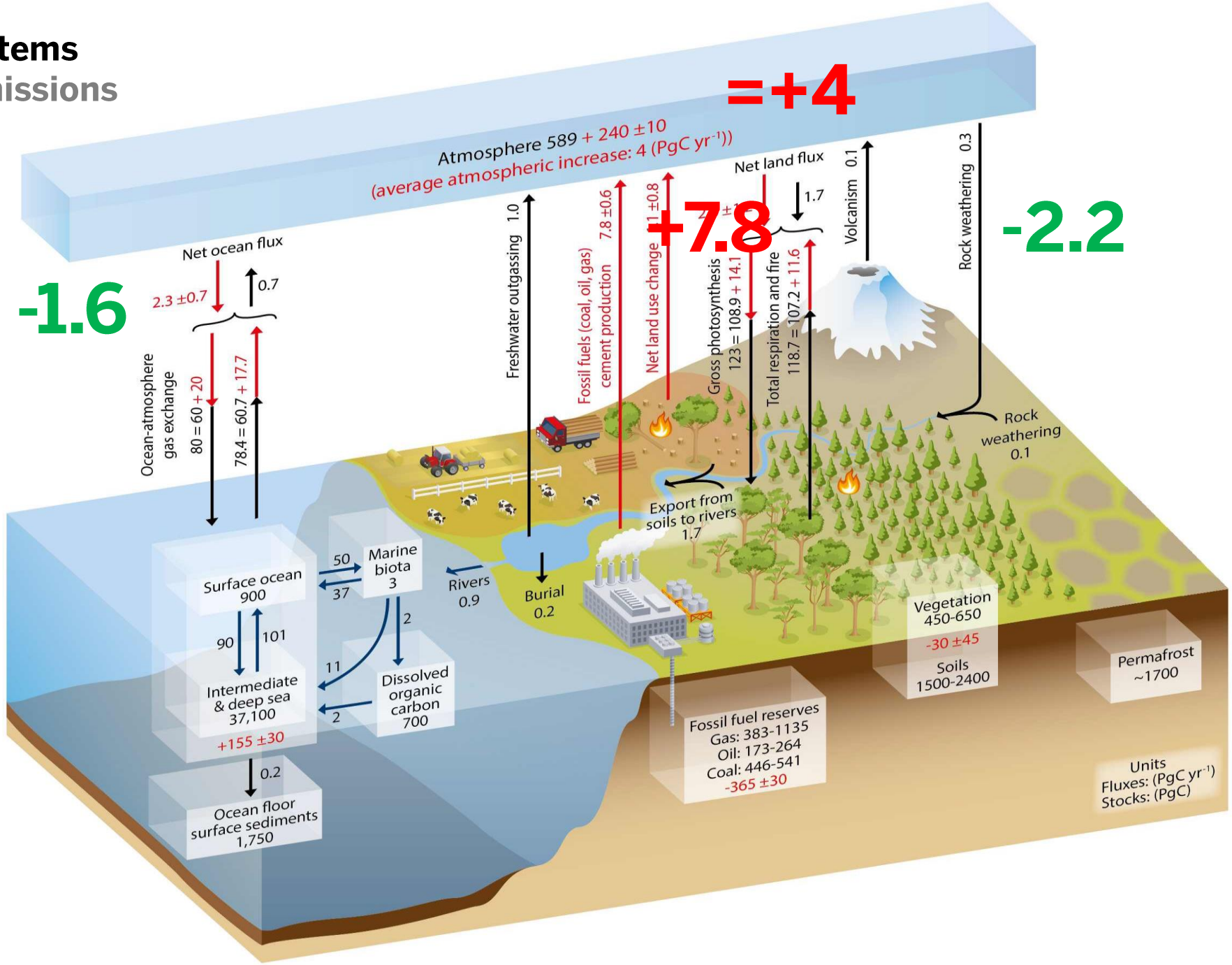
Absorb Half of the Carbon Emissions



PgC yr $^{-1}$ = 1,000,000,000 Tons Carbon/Year

IPCC

In the last 7,800 year, the total carbon loss as a consequence of desertification is between 450-500 gigatons of carbon – more than the TOTAL amount of fossil fuel

Food and Agriculture Organization (FAO) – United Nations
Carbon Sequestration in Dryland Soils

NATURAL RESILIENCE

SOM