

HUMAN IMPACTS by the numbers

Griffin Chure¹, Avi Flamholz², Nicholas Sarai³, Tine Valencic¹, Yinon Bar-On⁴, Ron Milo⁴, and Rob Phillips^{2,5,*}

¹Department of Applied Physics, California Institute of Technology, Pasadena, CA, 91125

²Division of Biology and Biological Engineering, California Institute of Technology, Pasadena, CA, 91125

³Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125

⁴Department of Plant and Environmental Sciences, Weizmann Institute of Science, Rehovot 7610001, Israel

⁵Department of Physics, California Institute of Technology, Pasadena, CA, 91125

ICE MELTING
 glacial melt volume $\approx ??? / \text{yr}$
 ice-cap melt volume $\approx ??? / \text{yr}$
 permafrost melt volume $\approx ??? / \text{yr}$
 total melt volume $\approx 10^{12} \text{ m}^3$

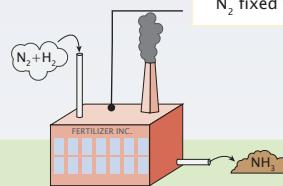
MATERIAL OF HUMAN ORIGIN

concrete production $\approx ?? \text{ kg} / \text{yr}$
 plastic production $\approx ?? \text{ kg} / \text{yr}$
 total production $\approx ?? \text{ kg} / \text{yr}$

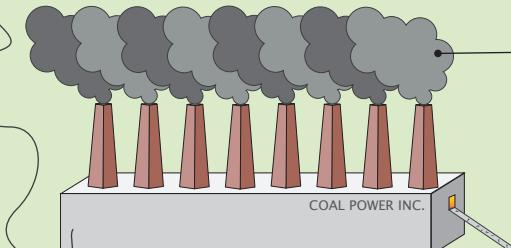
RISING SEA LEVELS

total annual sea-level rise $\approx 3 \text{ mm} / \text{yr}$
 rise from melt-water $\approx 2 \text{ mm} / \text{yr}$
 rise from thermal expansion $\approx 1 \text{ mm} / \text{yr}$

NITROGEN FIXATION
 N_2 fixed via Haber-Bosch process $\approx 1 \text{ Tg}$



GLOBAL POWER USAGE
 global power usage $\approx 20 \text{ TW}$



[H⁺] increase in oceans from CO_2 absorption $\approx 0.001 \text{ pH units} / \text{year}$

LIVESTOCK

chicken population $\approx 20 \text{ billion}$
 cattle population $\approx 2 \text{ billion}$
 pig population $\approx 1 \text{ billion}$

total livestock population $\approx 30 \text{ billion}$

EXTENT OF TERRESTRIAL LAND USAGE

agricultural area $\approx 5 \times 10^{13} \text{ m}^2$
 urban area $\approx ???$
 other land area $\approx ???$

total area $\approx ???$

HUMAN WATER USAGE
 power plant cooling $\approx 2 \times 10^9 \text{ m}^3 / \text{day}$
 agriculture $\approx 1 \times 10^9 \text{ m}^3 / \text{day}$
 personal use $\approx ???$
 total water use $\approx 10^{10} \text{ m}^3 / \text{day}$

CARBON DIOXIDE RELEASE
 annual CO_2 released from human action $\approx 10 \text{ Gt} \approx 1000$ volcanoes

EROSION
 soil moved by humans $\approx 40 \text{ Gt} / \text{yr}$

EXTINCTION RATE

PLUTONIUM FROM NUCLEAR FALLOUT
 plutonium radioactivity from nuclear weapons testing $\approx 1 \text{ decay} / \text{sec} / \text{kg}$
 $(\approx 50-70 \text{ cm depth})$

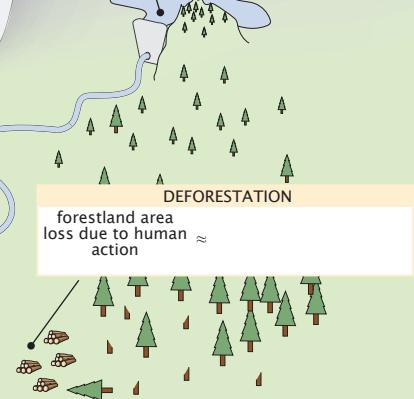
coal mineral resources

DAMMING OF RIVERS

global volume of dammed rivers $\approx 10^{12} \text{ m}^3$
 hydroelectric power generation $\approx 1 \text{ TW}$

FOSSIL FUEL MINING

volume of fossil fuels mined \approx annually



oil mineral resources

HUMAN IMPACTS by the magnitudes

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THE ANTHROPOCENE

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THE MAGNITUDE OF HUMAN WATER USAGE

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HUMANS AS THE EARTH'S GREATEST EVOLUTIONARY FORCE

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HUMAN IMPACTS ON ATMOSPHERIC AND BIOGEOCHEMICAL CYCLES

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THE MAGNITUDE OF HUMAN ENERGY USAGE

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