

Geopolitical aspects of climate change

Prof. I.Radovic, PhD, State Secretary

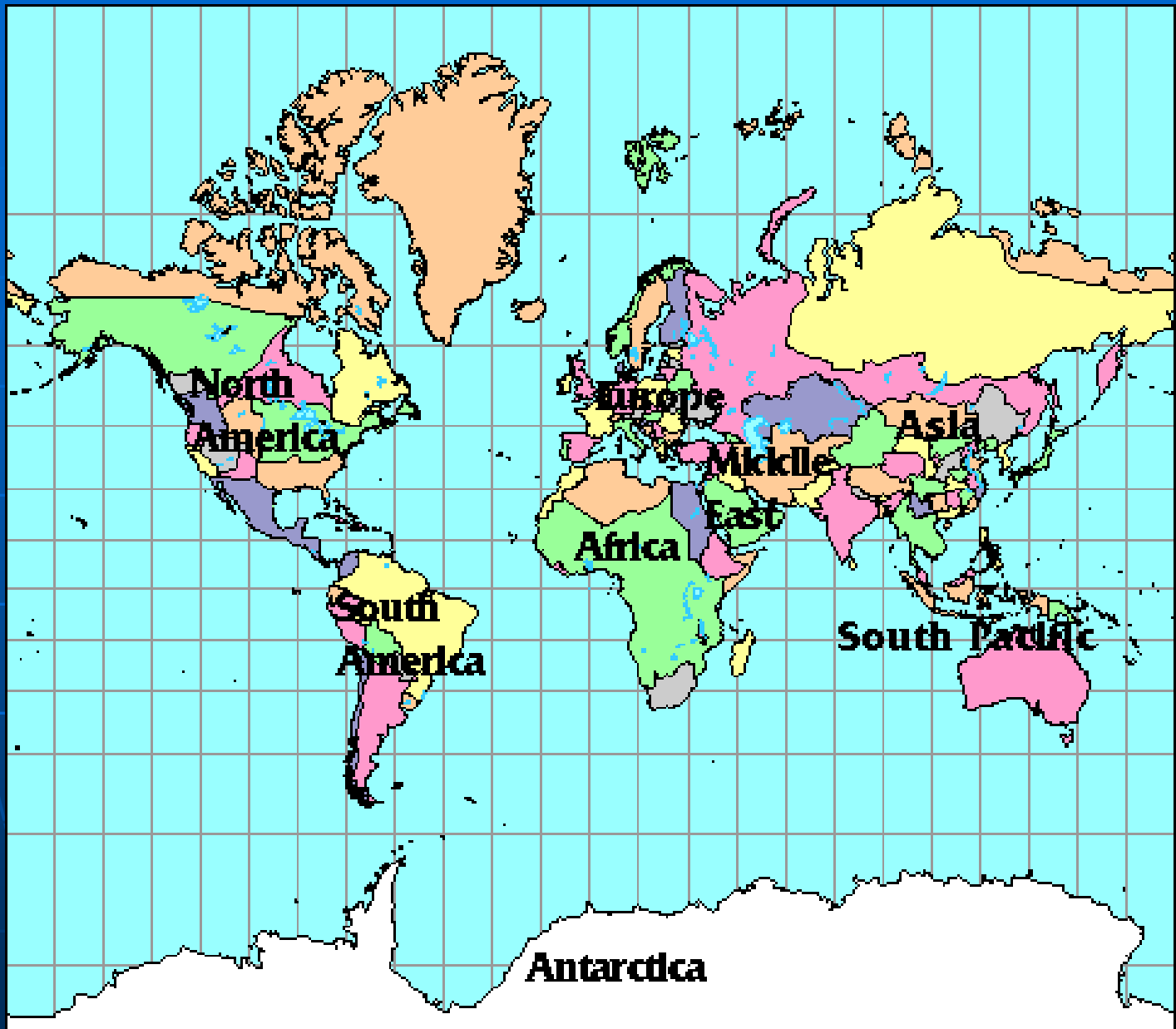
J. Cvetkovic, Assistant Minister

D. Bozanic, Head of Climate Change Unit

The Ministry of Environment and Spatial Planning

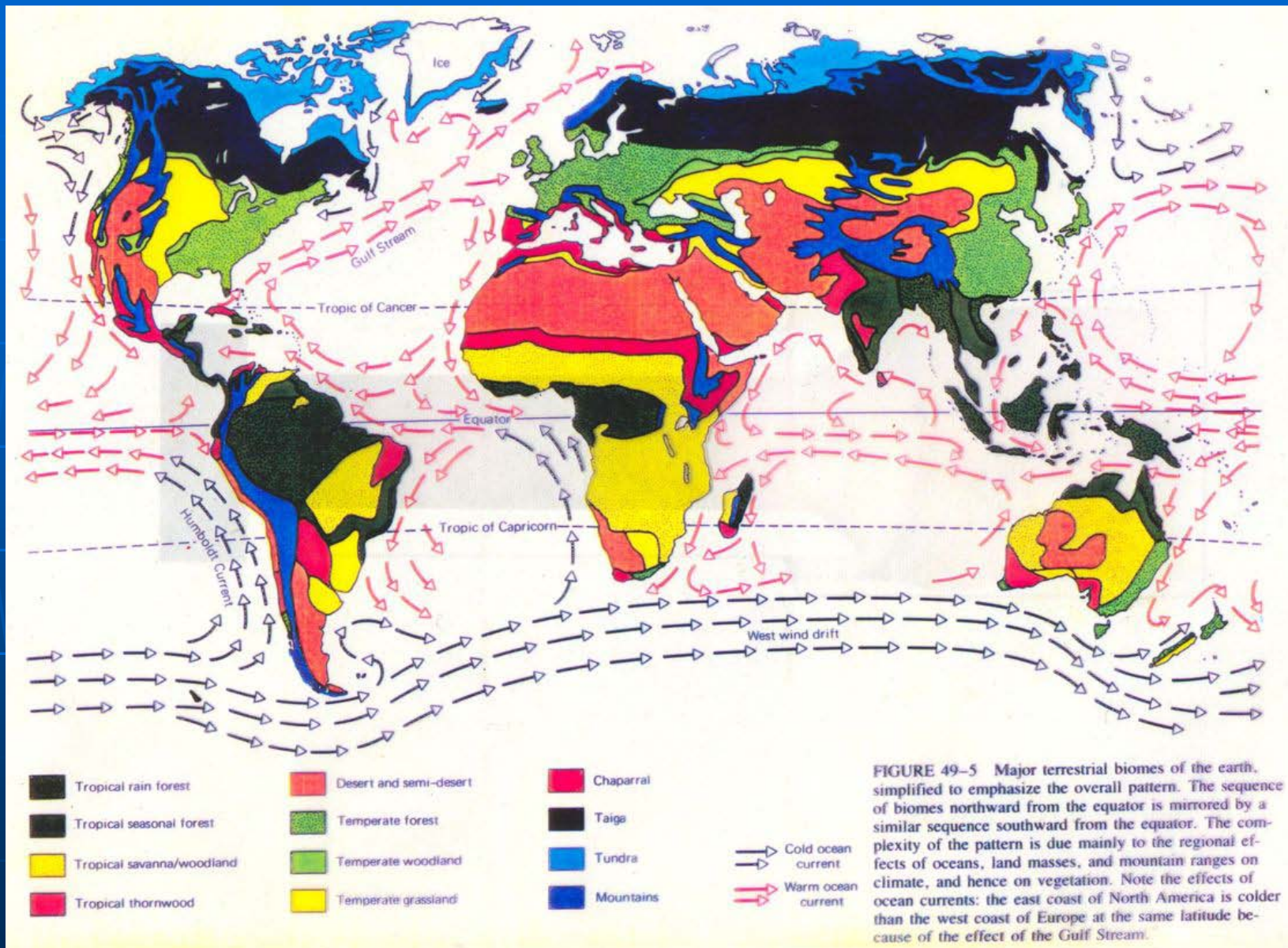
Republic of Serbia

*Danube Rectors' Conference
5 February 2010, Novi Sad*



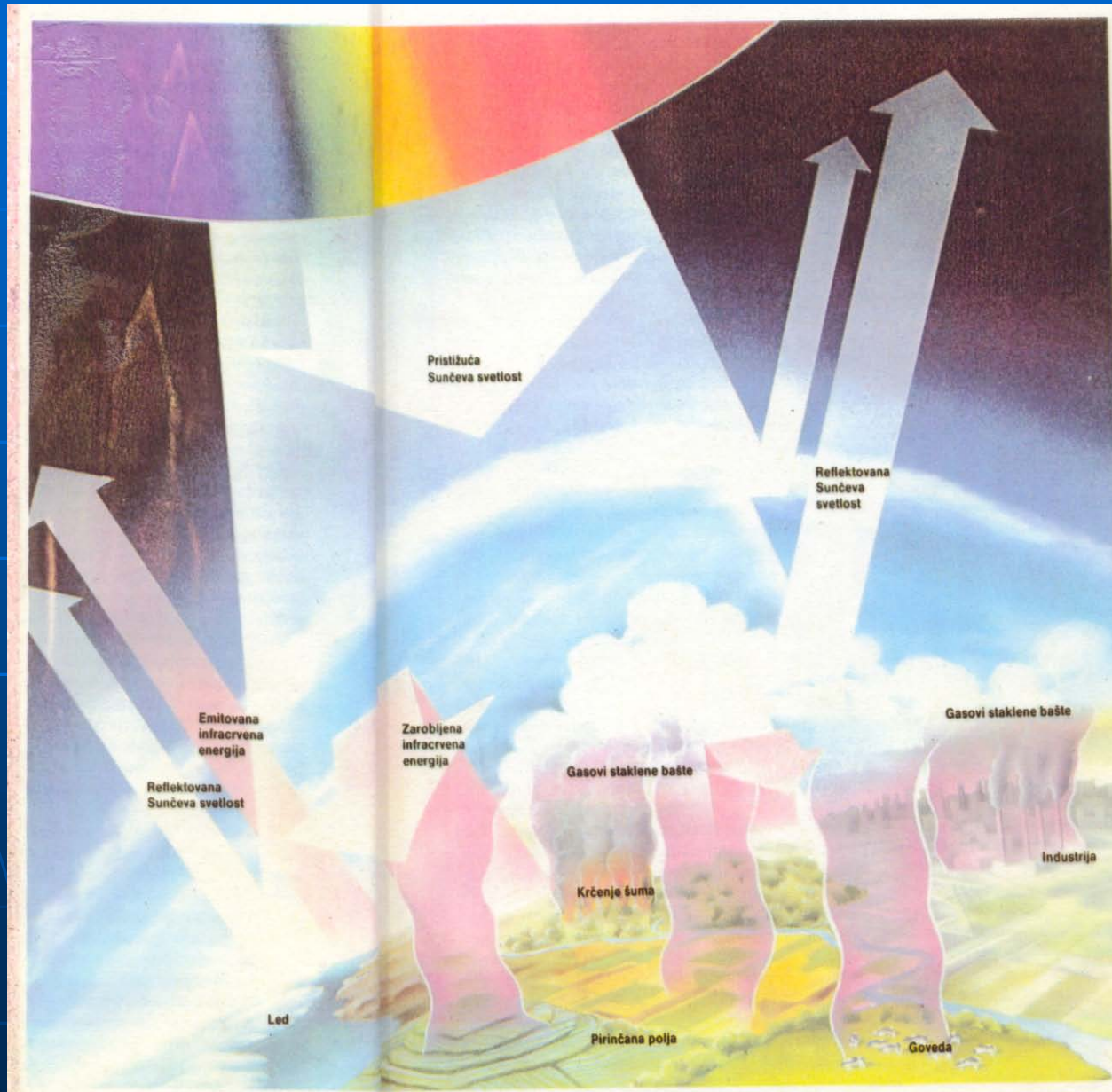
A combination of geographic and political factors relating to or influencing a nation or region

Biogeographical map of major terrestrial biomes of the Earth



A biome is a large relatively distinct terrestrial region with characteristic climate, soil, plants and animals

Greenhouse gas effect

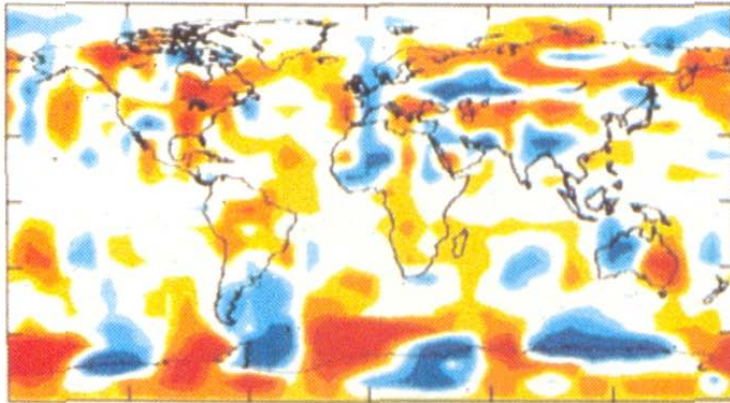


GLOBALNA STAKLENA BAŠTA

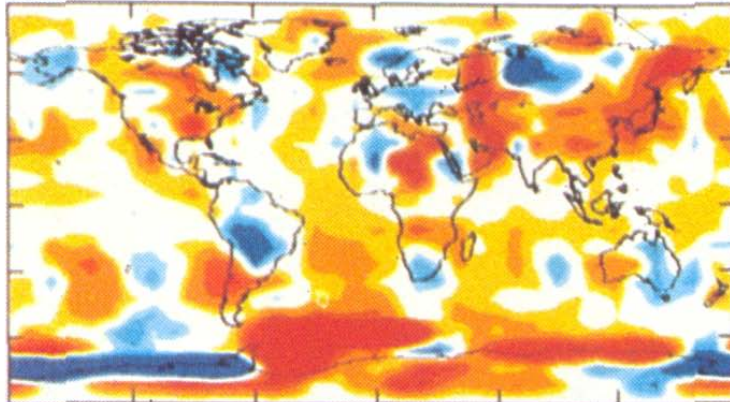
Kao deo prirodnog ciklusa, direktni Sunčevi zraci (ne oni koji se odbijaju o led i oblake) zagrevaju Zemlju. Tokom milenijuma prilično stabilna količina ove toplote vraćala se u vasionu u vidu infracrvene energije. Savremena industrija i poljoprivreda izmenili su tu delikatnu ravnotežu proizvodeći ugljen-dioksid i druge gasove koji zarobljavaju toplotu u atmosferi. Nagomilavanje tih gasova „staklene bašte“ moglo bi izazvati tendenciju zagrevanja u svetskim razmerama.

Ilustracija: Jan Wozniak, Discovery Syndication

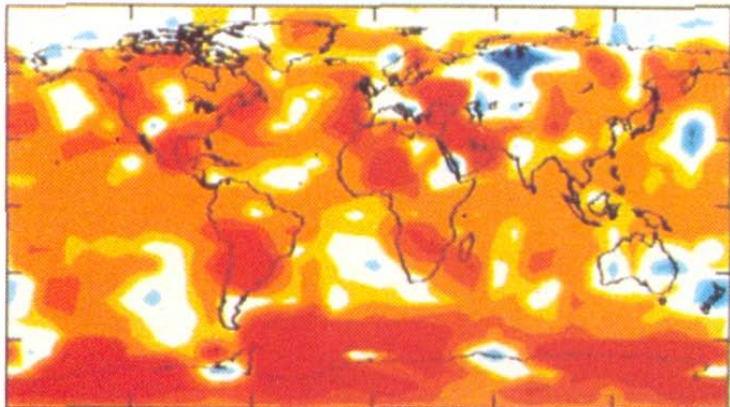
Jul 1987.



Jul 2000.



Jul 2029.



NASA

Global warming is SWITCHED ON

It is difficult to predict the real nature of green house gas impacts on the specific location, although scientists believe:

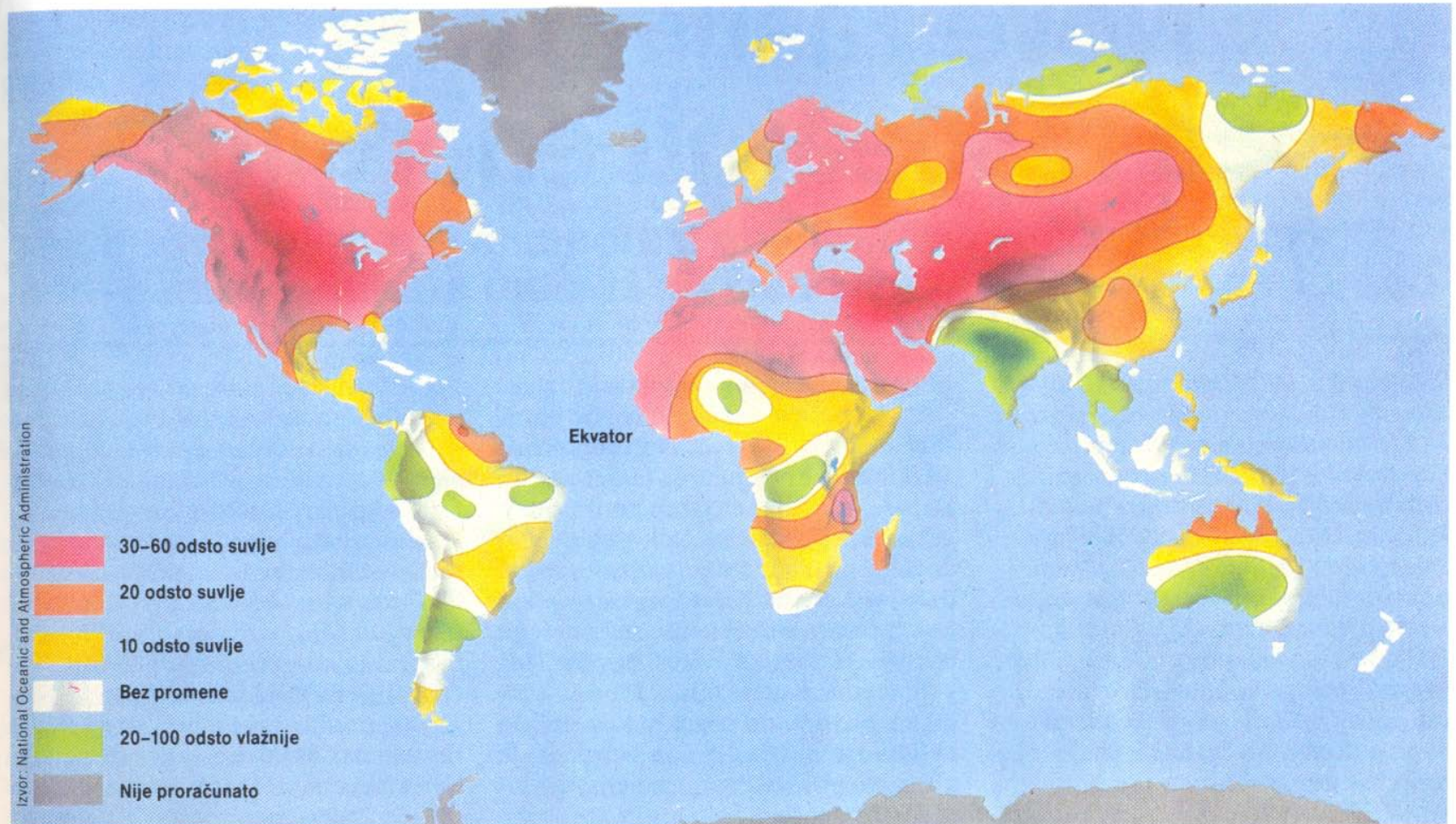
Climate changes are reality

This model shows potential changes in July's temperatures, during the period of 40 years.

The temperature changes: over the *white areas*, were estimated as insignificant, *blue colored areas* could get cooler, while over the *yellow, orange and red areas* expected increasing of temperature is between 1 and 5°C.

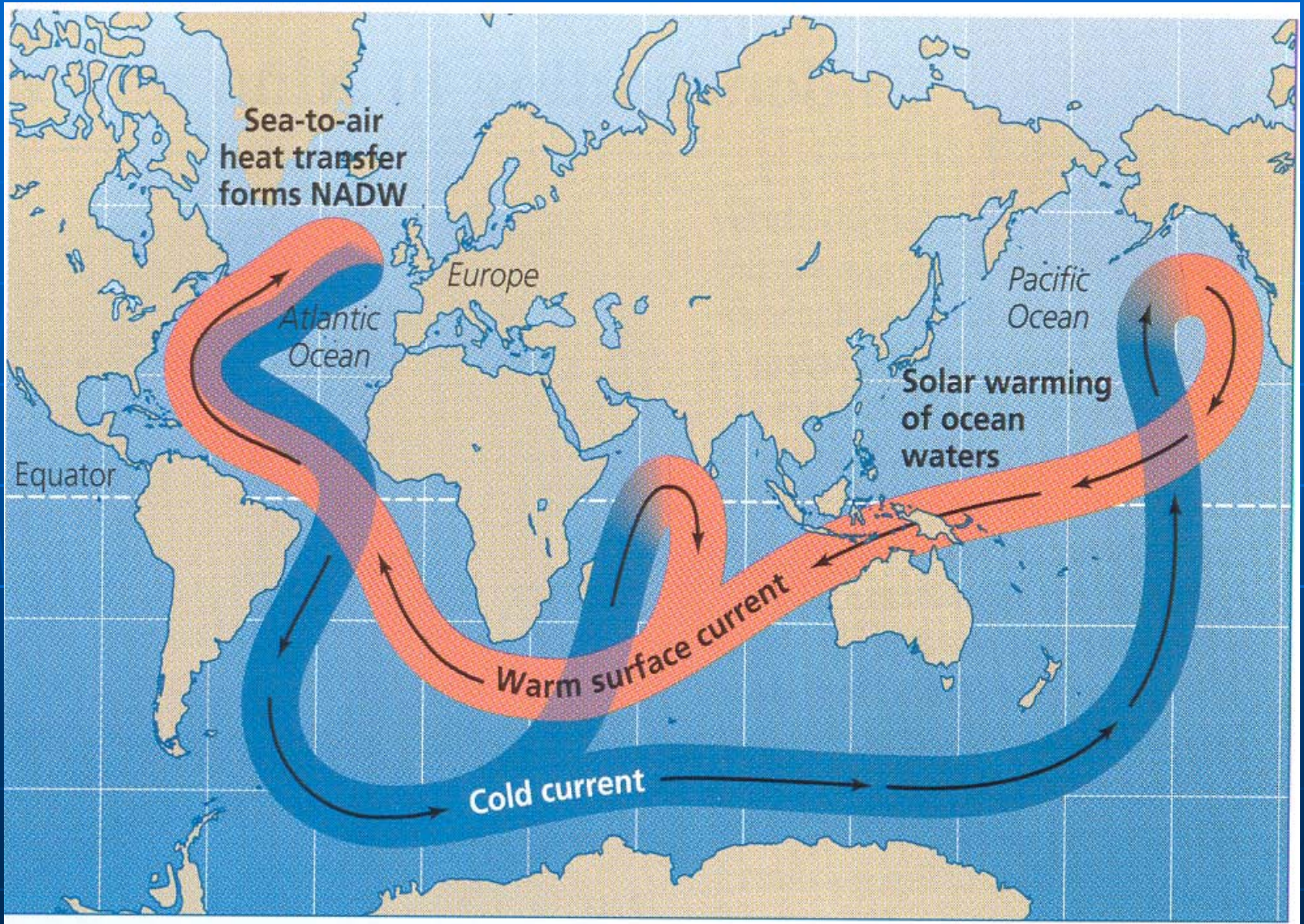
Climate projections: increased and decreased precipitation

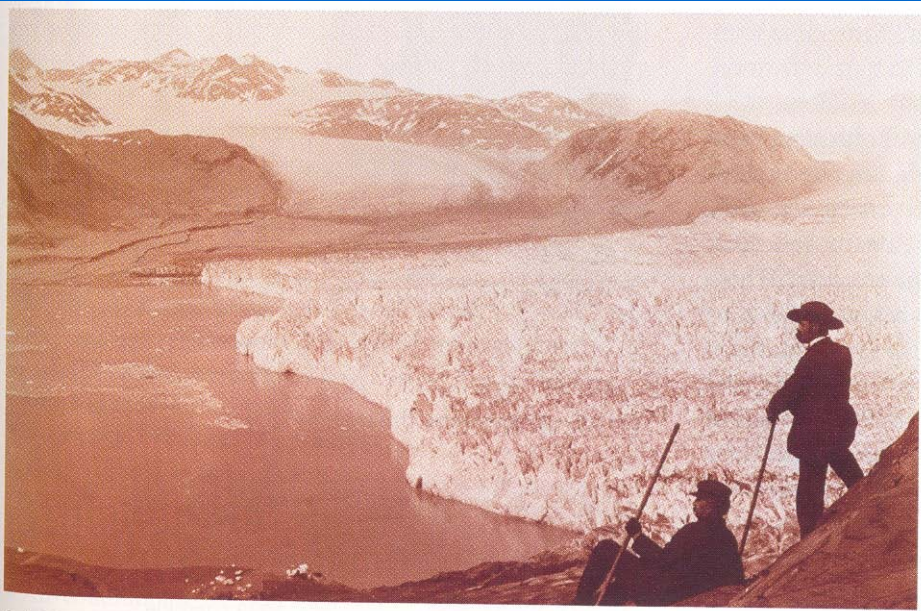
BUDUĆNOST STAKLENE BAŠTE: I VLAŽNA I SUVA



Jedno predviđanje verovatnih promena u količini padavina usled dejstva staklene bašte: većina regiona u unutrašnjosti postaće suvlja; u nekim priobalnim oblastima biće mnogo više kiša usled toplije morske vode; ekološke zone pomeriće se ka višim geografskim širinama, izazivajući poremećaje u današnjoj poljoprivredi.

Climate change directly affects world oceans





(b) Glacier Bay, 1892

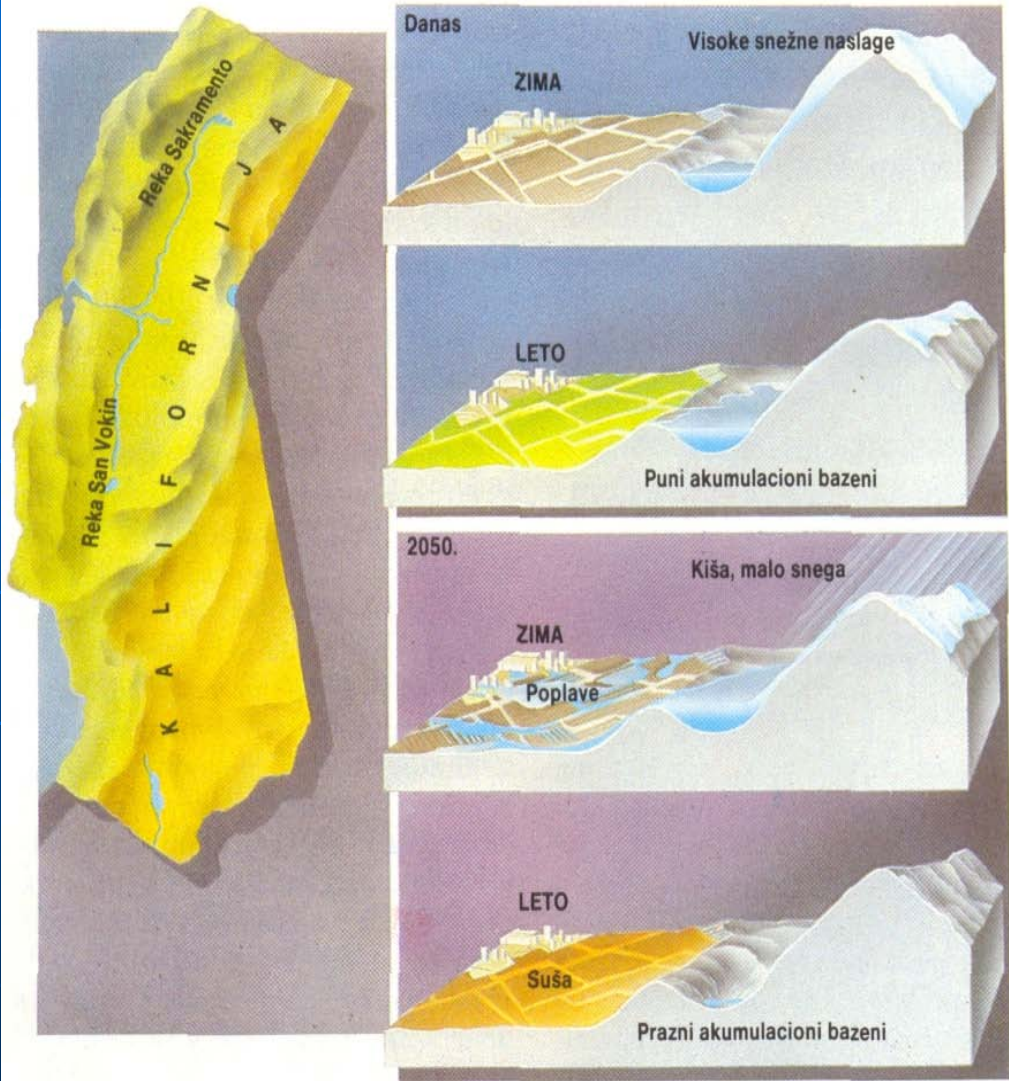
Global warming is SWITCHED ON

***Glacier fiord, National park and
Nature Reservat (Alaska):
During the period 1794 -2005
105 km of ice retreated***



(a) Glacier Bay National Park and Preserve

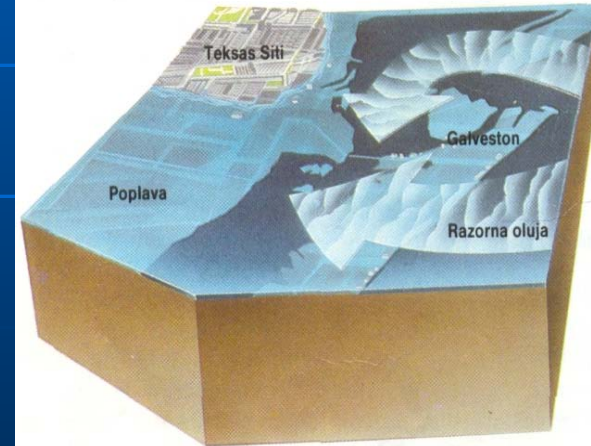
NEPRIJATNOSTI SA VODOM



California today and 2050

Climate change analysis on the regional level

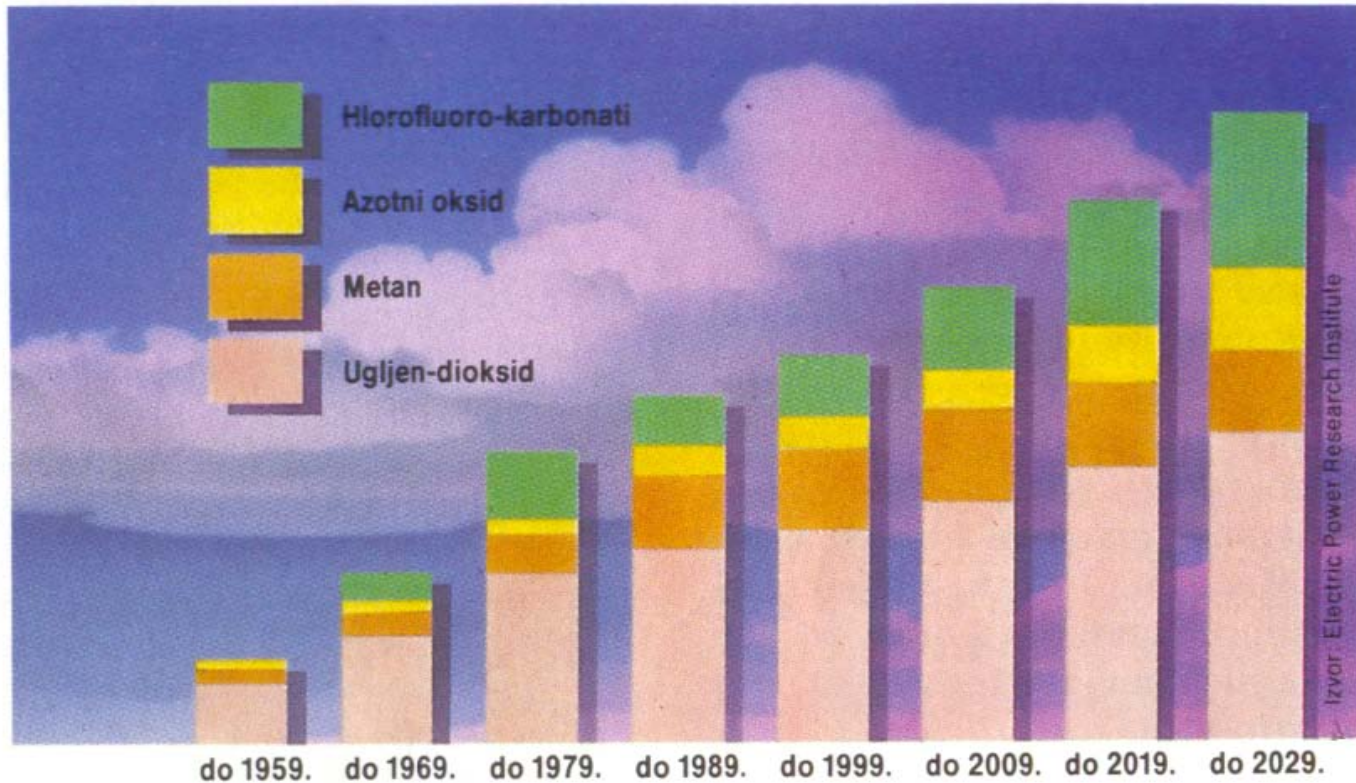
Toplija klima može prouzrokovati razne probleme u vezi sa vodom. U Kaliforniji može pasti više padavina na planinama u vidu kiše nego snega (gore). Zatim, umesto čvrstog snega koji će se leti topiti i tako puniti akumulacione bazene te savezne države, kiša će se slivati sa zemlje, dovodeći zimi do poplava, a leti do oskudice vode. Smanjivanje naslaga leda i snega na polovima doprineće podizanju morskog nivoa u celom svetu i plavljenja priobalnih naselja kao što su Galveston u Teksasu (dole), koja su izgrađena na pregradnim ostrvima. Uragani umerene jačine dovešće do daleko većeg broja razornih oluja.



Coastal part of Texas (Galveston)

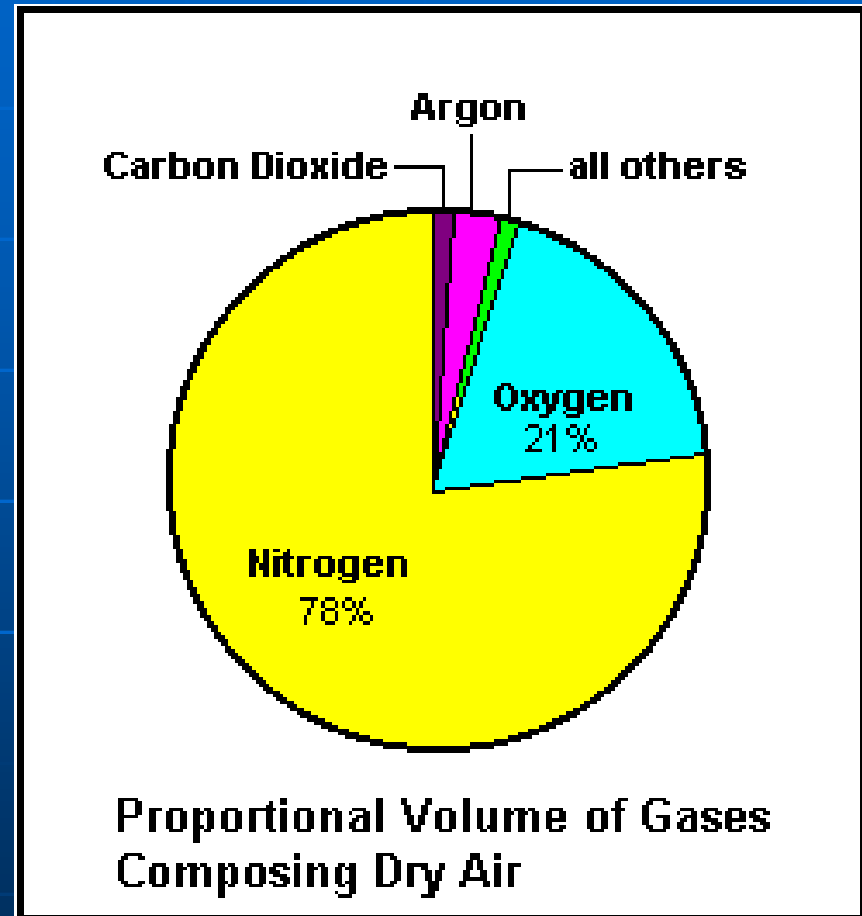
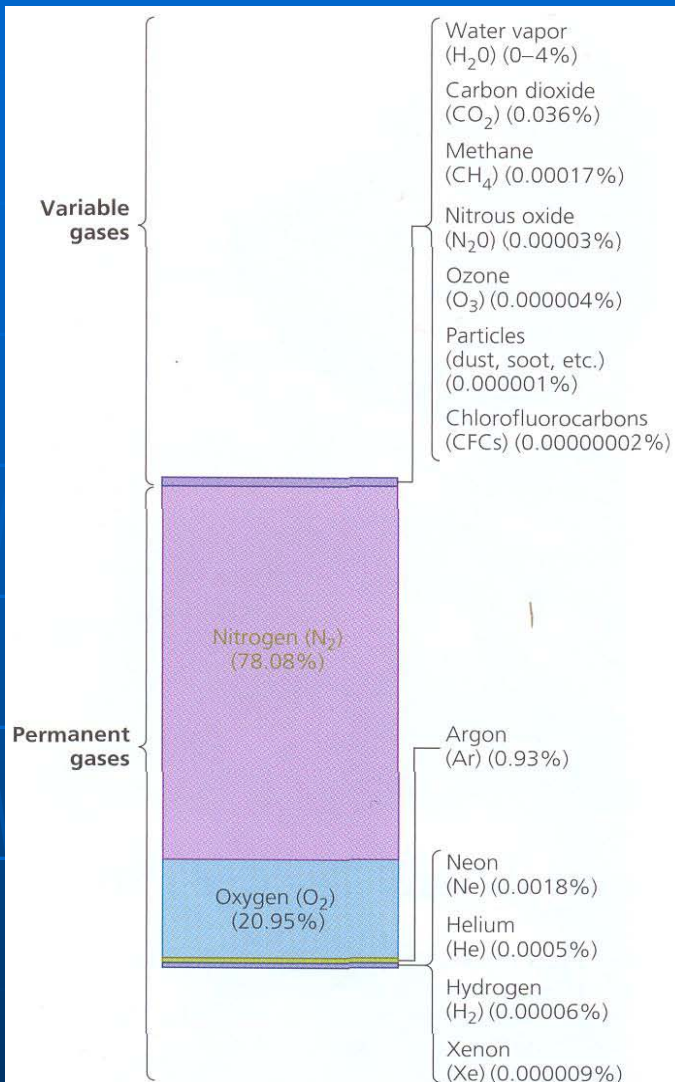
Greenhouse gases

GASOVI STAKLENE BAŠTE



Ovaj grafikon pokazuje frakcije globalnog zagrevanja izazvanog raznim gasovima. U atmosferi je sve više ugljen-dioksida, ali drugi gasovi efikasnije apsorbuju infracrvenu energiju. Do 2010. godine ti manje rasprostranjeni gasovi mogu biti odgovorni za polovinu povećanja temperature, koje će nastaviti da se ubrzava ukoliko se nešto ne preduzme.

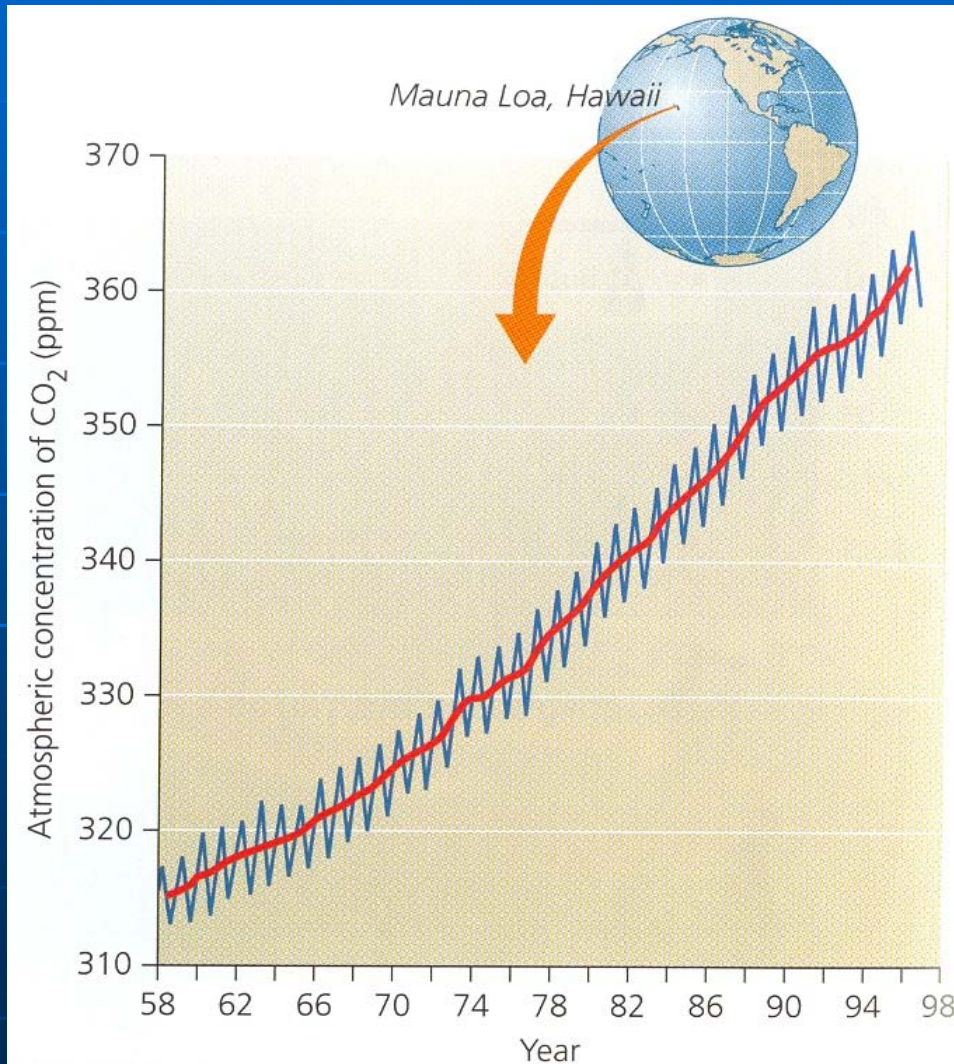
Air Composition



Proportional Volume of Gases Composing Dry Air

Air in our atmosphere consists mostly of nitrogen, secondarily of oxygen, and lastly of a mix of minor gases, some of which are fixed in their concentration and some of which are variable in their concentration, due either to natural causes or human-induced change. Data from Donald C. Ahrens, *Essentials of Meteorology*, second edition, Wadsworth Publishing Company, 1998.

Increase of CO₂ concentration 1958 - 1998



“Timing curve”

Up – winter period

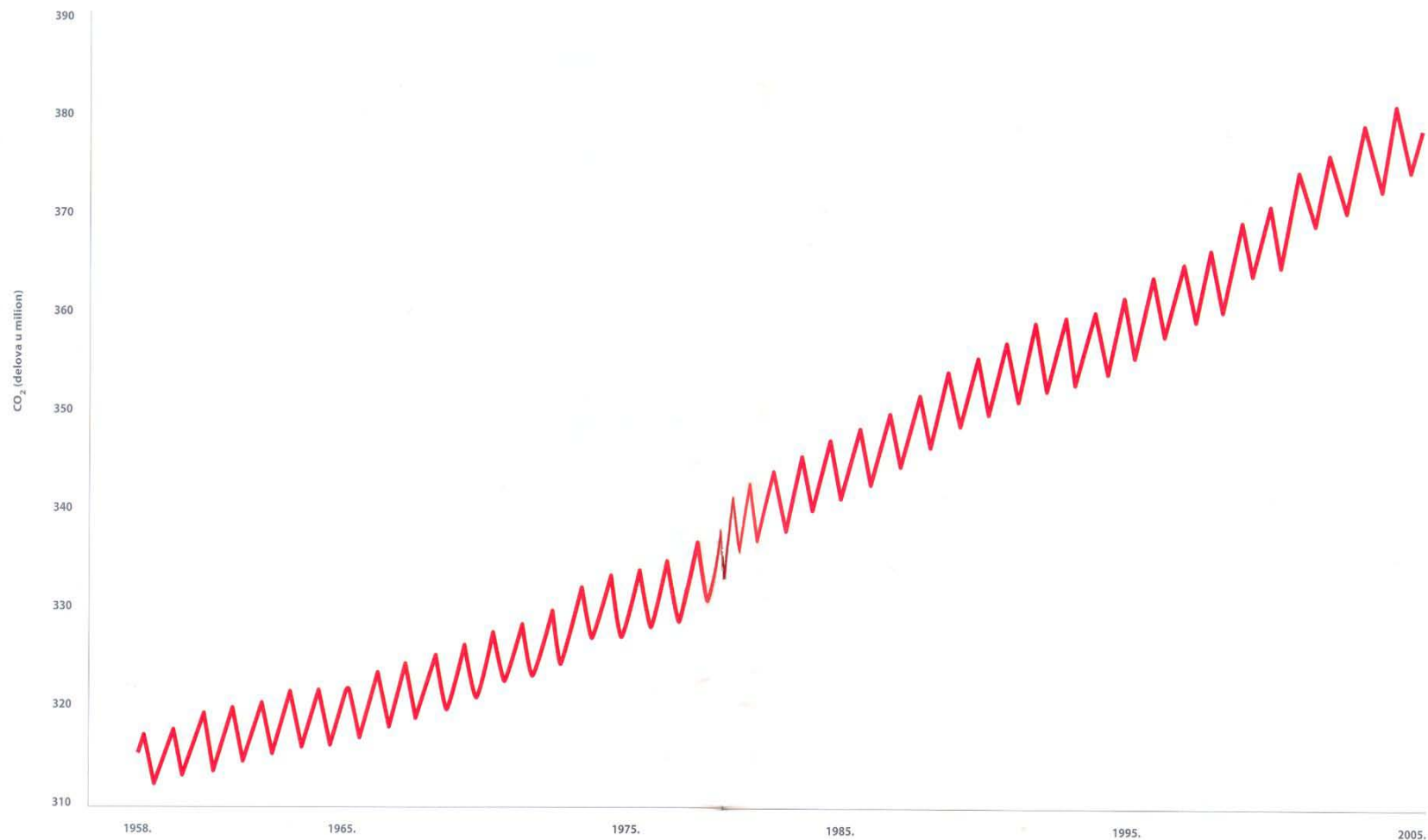
(without
photosynthesis)

Down – summer period

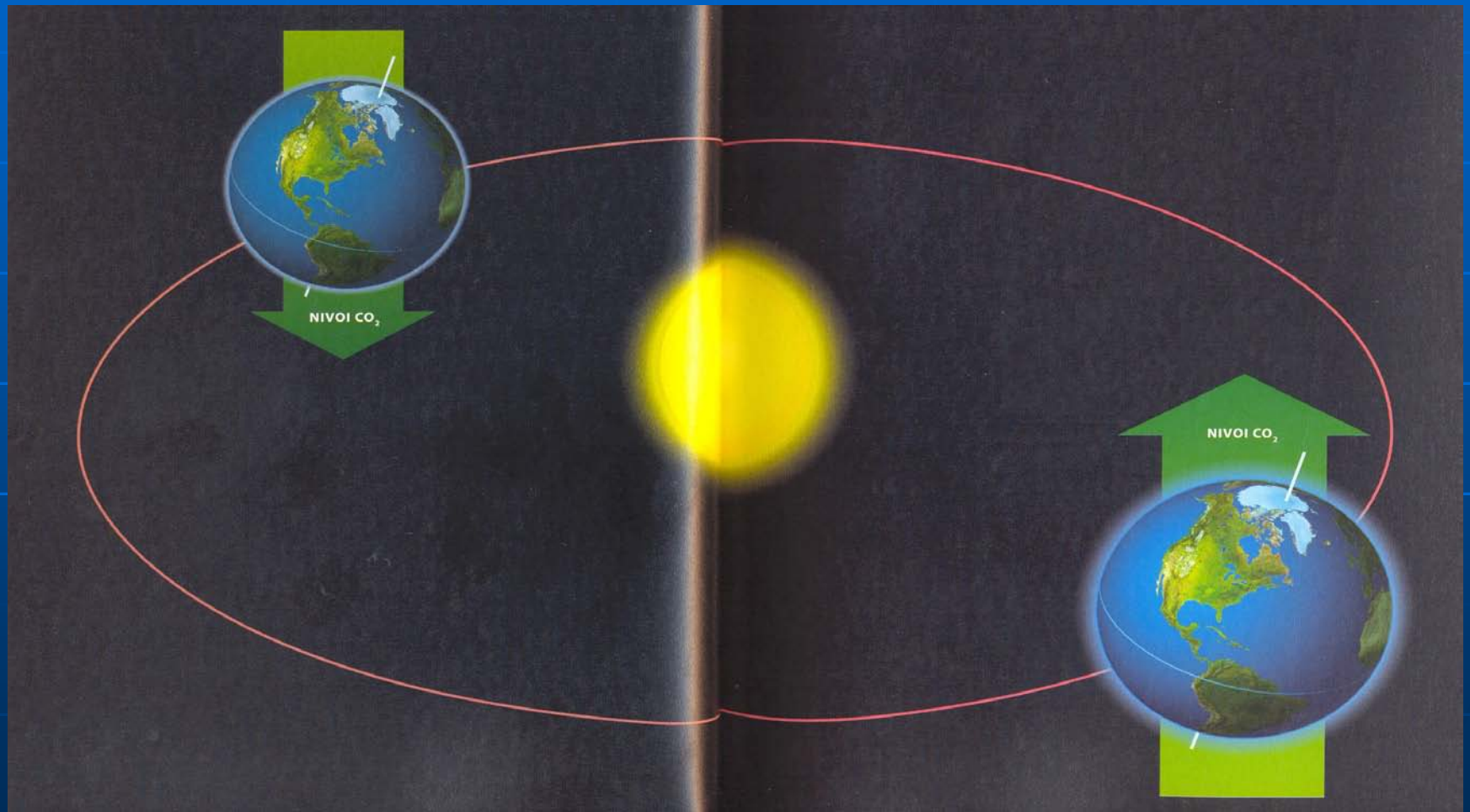
(with photosynthesis)

Zonobiom of deciduous
forests moderate
continental type

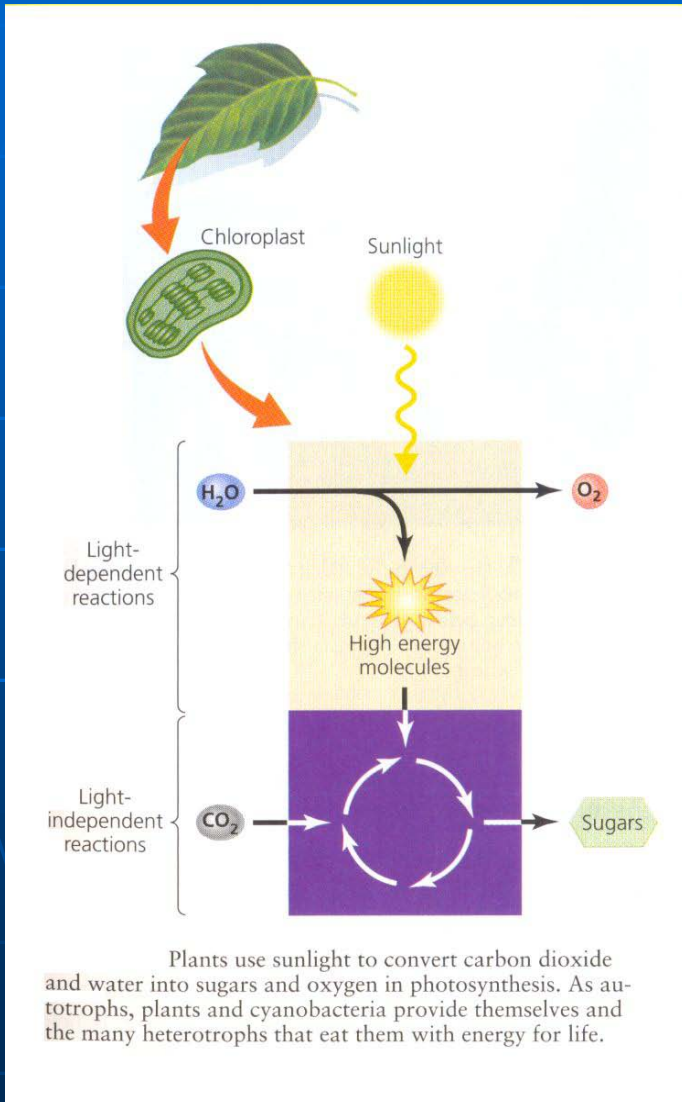
Increase of CO₂ concentration 1958 - 2005



*Once a year the Earth
"breathes in" and "breathes out"*



CO₂ and H₂O are inputs for organic synthesis, and at the same time the most important factors of global threatens for life on the Earth



Teofrastus Filipus Aureolus
Bombastus von Hoenajm



Paracelsus – Patriarch of the toxicology:
"Everything could be a poison - the dose concerns."

born: 11. 11. 1493. Ajnzideln (Switzerland)
died: 24. 9. 1541. Salcburg (Austria)

Solutions are required:

Traži se rešenje

ENERGETSKA EFIKASNOST

Fabrika frižidera. Zahtev da uređaji, kola, kuće i osvetljenje efikasnije koriste energiju može u dovoljnoj meri smanjiti upotrebu fosilnih goriva kako bi se emitovanje ugljen-dioksida zadržalo na bezmalo sadašnjem nivou tokom sledećih osamdeset godina. Taj cilj se može postići globalnim poboljšanjem energetske efikasnosti za dva odsto godišnje.



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ALTERNATIVNI IZVORI ENERGIJE

Kolektori solarne energije. Proizvodni troškovi solarnih ćelija mogli bi do 2000. godine pasti na pola dolara po jednom watu. To bi učinilo solarnu energiju konkurentnom u odnosu na energiju koja se dobija iz konvencionalnih izvora fosilnog goriva koji doprinose zagrevanju Zemlje.



© 1984 Dan McCoy

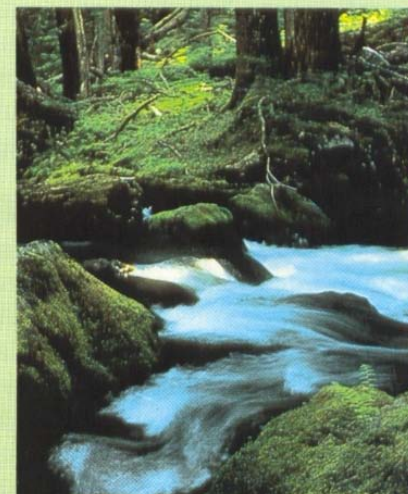
- ENERGY EFFICIENCY
- RES
- NATURAL GAS
- FORESTRY PROTECTION



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PRIRODNI GAS

Gasovodi za prirodni gas. Sagorevanje prirodnog gasa emituje svega 70 odsto ugljen-dioksida u odnosu na naftu, a svega 60 odsto u odnosu na ugalj. Rezerve gasa postoje u izobilju širom sveta.



© 1985 JORI W. ROBERTS

OČUVANJE ŠUMA

Svake godine u tropskim predelima se uništi oko 100 000 kvadratnih kilometara šuma da bi se dobilo poljoprivredno zemljište ili ogrev. Krčenje šuma je doprinelo dejstvu staklene bašte pošto fotosinteza deluje kao prirodni sunder za ugljen-dioksid, a usled sagorevanja drveta nastaje metan. Mnoge zemlje u poslednje vreme počinju da uvode programe za obnavljanje šuma.



International climate change policy (1)

1) The UN Framework Convention on Climate Change

- The ultimate objective: Achievement of greenhouse gas concentrations stabilization in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system;
- Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

2) The Kyoto Protocol

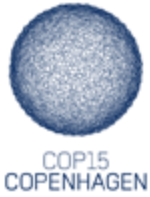
- The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.



International climate change policy (2)

3) *The post-Kyoto period - when the Kyoto Protocol runs out*

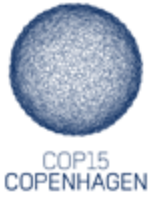
- Most scientists agree the climate is in a state of flux;
- The IPCC: The global average temperature increase, in the past century, a 90 percent likelihood is due to greenhouse gas emissions produced by human activity, such as deforestation and the fossil fuel combustion;
- A slight spike in temperature has already been linked to drought, heat waves, and storms around the world;
- Result: Need for continuity of actions.
- Scientific background - base for political decision;
- Need to keep the process on the line - an urgent need for a comprehensive, ambitious, legally binding new climate protocol.
- Copenhagen Conference: "the moment in history in which humanity had the opportunity to rise to the challenge" .



UNITED
NATIONS
CLIMATE
CHANGE
CONFERENCE
2009

Copenhagen Conference *- expectations -*

- Make clear how much developed countries, such as the U.S., Australia, and Japan, will limit their greenhouse gas emissions;
- Determine how, and to what degree, developing countries, such as China, India, and Brazil, can limit their emissions without limiting economic growth;
- Explore options for "stable and predictable financing" from developed countries that can help the developing world reduce greenhouse gas emissions and adapt to climate change;
- Identify ways to ensure developing countries are treated as equal partners in decision-making, particularly when it comes to technology and finance;
- The result : COP takes note of the Copenhagen Accord – inviting Parties wishing to associate themselves with it until 31 January.



UNITED
NATIONS
CLIMATE
CHANGE
CONFERENCE
2009

Copenhagen Conference *- results -*

- Three key things that Copenhagen produced:
 - 1) It raised climate change to the highest level of government;
 - 2) The document that reflects a political consensus on the long-term, global response to climate change;
 - 3) The negotiations brought an almost full set of decisions to implement rapid climate action near to completion.
- A political accord that does not force countries to reduce emissions and has no legal standing anyway;
- COP takes note of the Copenhagen Accord – invites a Parties wishing to associate themselves with it until 31 January.



The Copenhagen Accord

- content (1) -

- Emphasizes “strong political will” to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities;
- Deep cuts in global emissions are required, according to science, in order to limit the increase in global temperature to below 2°C;
- Parties should cooperate in achieving the peaking of global and national emissions as soon as possible, recognizing that the time frame for peaking will be longer in developing countries;
- Adaptation to the adverse effects of climate change and the potential impacts of response measures is a challenge faced by all countries. Developed countries shall provide adequate, predictable and sustainable financial resources, technology and capacity building to support adaptation actions;



The Copenhagen Accord - content (2) -

- Annex I parties commit to implement, individually or jointly, quantified economy-wide emission targets for 2020, to be submitted by 31 January 2010 for compilation in an INF document. Protocol Annex I parties will thereby further strengthen the emission reductions initiated by the Protocol;
- Non-Annex I parties will implement mitigation actions, including those to be submitted by 31 January 2010, for compilation in an INF document. Mitigation actions shall be communicated through national communications every two years. Unsupported actions will be subject to domestic MRV. Supported NAMAs will be subject to international MRV;
- Collective commitment by developed countries is to provide new and additional resources, including forestry and investments through international institutions, approaching US\$30 billion for the period 2010-2012 with balanced allocation between adaptation and mitigation. Developed countries also commit to a goal of jointly mobilizing US\$100 billion a year by 2020 to address the needs of developing countries, with funding coming from a wide variety of sources...



The Copenhagen Accord

- analysis (1) -

- An outline of a future framework to address climate change;
- Developed and developing countries: Pledges for information purposes to the Convention
 - 1) Developed countries – without commitment for legally-binding emission reductions, focus on the measurement, reporting and verification (MRV) of actions (one of the major stumbling blocks in the negotiations leading to Copenhagen)
 - 2) Mitigation by developed countries - “clearly weak” and “a step backwards from the Kyoto Protocol”;
- There is no quantification of a long-term global goal for emission reductions, or specific timing for global emissions to peak;
- “The most successful part of the Accord” - short and long-term financing. It calls on developed countries to provide support of poor nations’ efforts without saying who pays what to whom;
- The Accord - contain some language, reportedly a compromise between the US and China;



The Copenhagen Accord *- analysis (2) -*

- The progress did not come easily, and alone is not enough;
- The fact that Copenhagen did not deliver the full agreement the world needs to address climate change "just makes the task more urgent";
- A cooling off period that gives countries useful and needed time to resume their discussions with each other;
- If countries follow up the outcomes of Copenhagen, there is a chance for completing the job and a better and legally-binding outcome (binding and ambitious international agreement on climate change).



In general

The Copenhagen outcome highlights:
An enormous amount of work remains to be done before people can safely believe that the world has seen a turning point in the fight against climate change!