

AIR POLLUTION

- Air pollution
- Composition of Air & Structure of Atmosphere
- National Ambient Air Quality Standards
- Classification of Air Pollutants
- Sources of Air Pollutants
(major air pollutants)
- Effects of Air Pollutants



INTRODUCITON



Lake Nyos in Cameroon, Africa.

on the night of August 21,
1986,





100,000–300,000 tons (1.6m tons, according to some sources) of carbon dioxide (CO₂)

CO₂ gas is heavier than air, it flowed downhill from the lake and settled in village, killing many animals and more than 1,800 people.

suffocated 1,746 people and 3,500 livestock in nearby towns and villages





BHOPAL GAS TRAGEDY



•Bhopal gas tragedy, was a gas leak incident in India, considered the world's worst industrial disaster.

Union Carbide India Limited (UCIL) was a chemical company established in 1934,

UCIL was 50.9% owned by Union Carbide Corporation (UCC) and 49.1% by Indian investors including the Government of India and government-controlled banks.

UCIL produced
batteries,
carbon products,
welding equipment,
plastics, industrial chemicals, pesticides, and marine products.



- It occurred on **the night of 2–3 December 1984** at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal, Madhya Pradesh.
- Over 500,000 people were exposed to **methyl isocyanate (MIC)** gas and other chemicals.

The official immediate death toll was **2,259**.

The government of Madhya Pradesh confirmed a total of **3,787 deaths**

A government affidavit in 2006 stated that the leak caused 558,125 injuries, including 38,478 temporary partial injuries, approximately 3,900 severely and permanently disabling injuries.

Others estimate that 8,000 died within two weeks, and another 8,000 or more have since died from gas-related diseases





Art/Design is © Cristian Arrieta Correa.

<http://cristianac.deviantart.com>

The artist's signature, which appears to be 'Cristian Arrieta Correa', is written in a stylized, cursive font in the bottom right corner of the image.

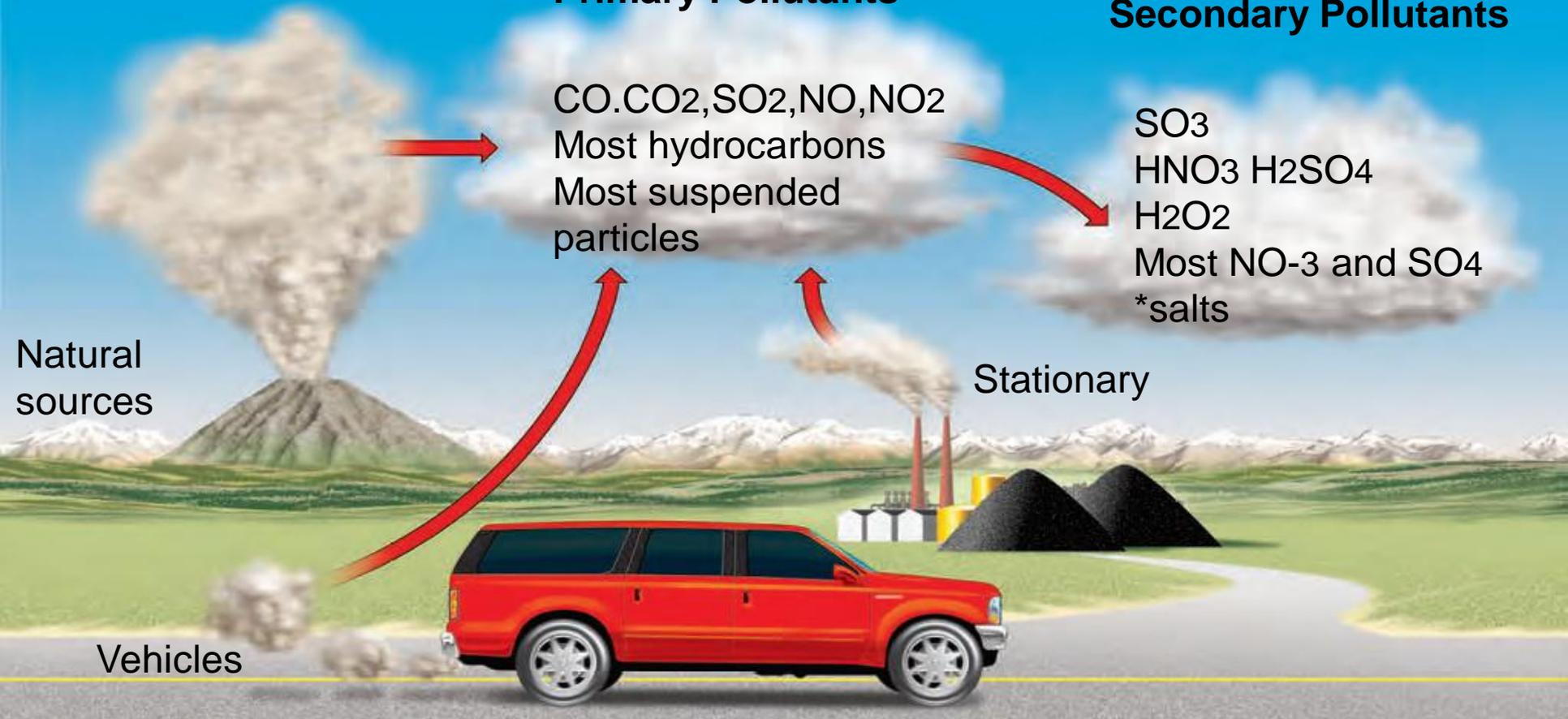


Primary Pollutants

CO, CO₂, SO₂, NO, NO₂
Most hydrocarbons
Most suspended particles

Secondary Pollutants

SO₃
HNO₃ H₂SO₄
H₂O₂
Most NO₃ and SO₄
*salts



Sources and types of air pollutants.



Air Pollution

- ❑ “Anything which degrades the quality of ambient air is known as Air Pollution”
OR
- ❑ “Presence of unwanted and undesirable foreign particles and gases in the air which may have adverse effects on living beings and important structure is known as Air Pollution”
- ❑ Air pollution is the presence of chemicals and particles in the atmosphere in concentrations high enough to harm organisms, ecosystems, or human made materials, or to alter climate.

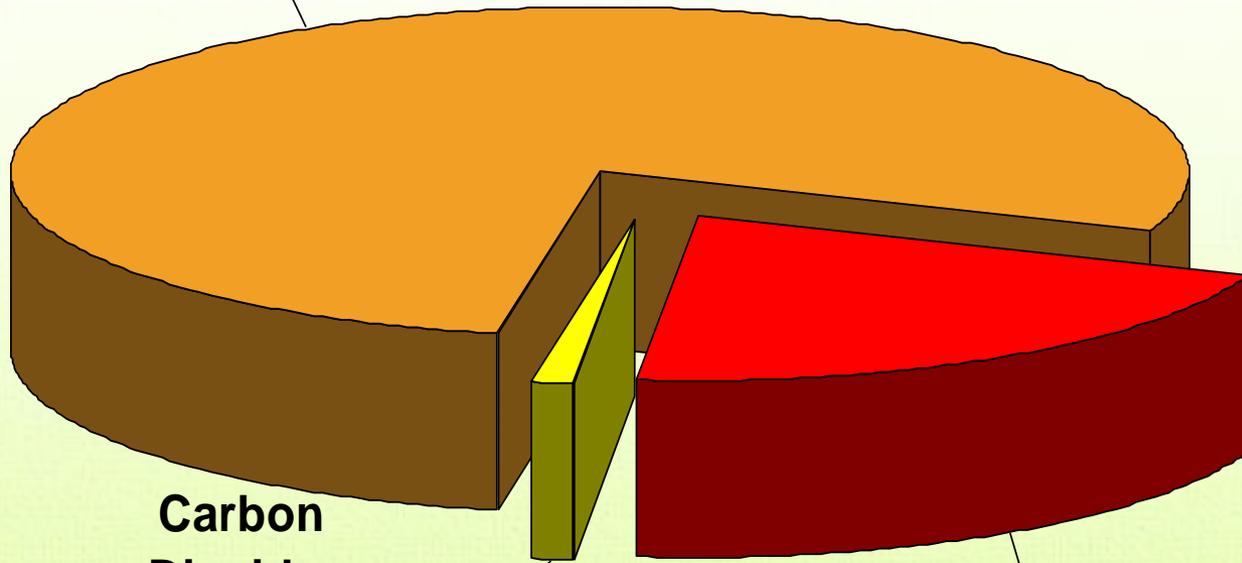
Pollutant

- ❑ “Any substance present in the environment in harmful concentration which can effect the quality of environment is known as Pollutant “

Composition of Air



Nitrogen
78%



**Carbon
Dioxide,
Water
Vapour and
other Gases**
1%

Oxygen
21%

Composition of Air



Nitrogen = 78%
Oxygen = 21%
CO₂ and = 1 % approx
Other gas

Other Gases or Trace gases : A trace gas is a gas which makes up less than 1% by volume of the Earth's atmosphere, and it includes all gases except nitrogen (78.1%) and oxygen (20.9%).

e.g. Water Vapours, Carbon Dioxide, Neon, Helium

Krypton, Hydrogen, Ozone.

Structure of Atmosphere



We live at the bottom of a thin envelope of gases surrounding the earth, called the atmosphere. It divided into several spherical layers Structure of atmosphere based on Altitude vs. Temperature profile.

(1) Troposphere

a

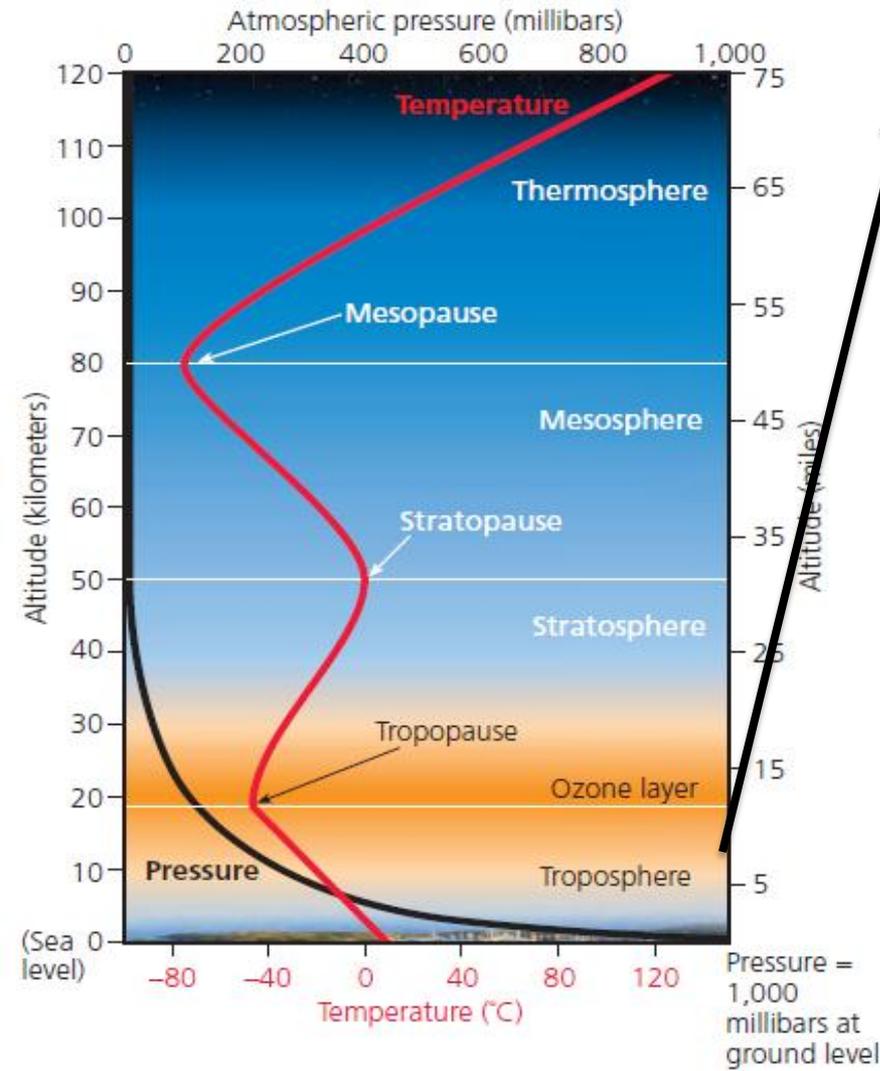
(2) Stratosphere

(3) Mesosphere

(4) Thermosphere

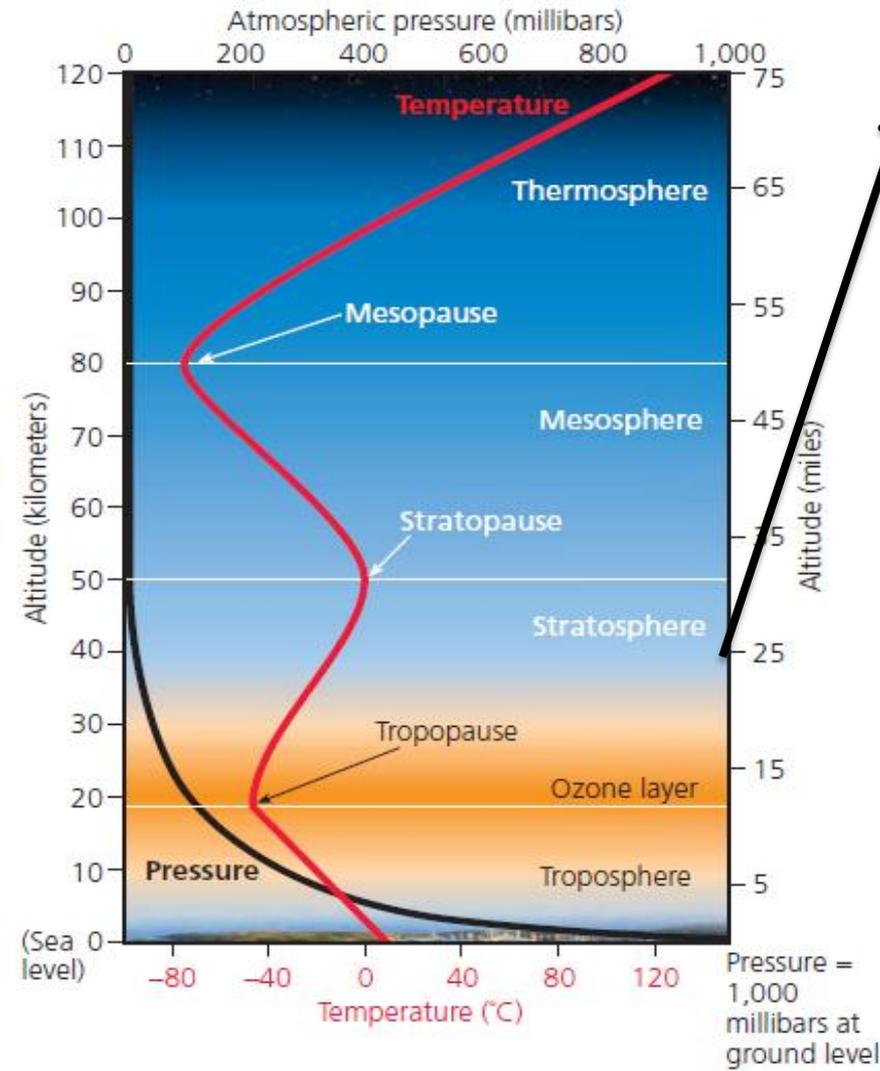
(5) Exosphere

Troposphere



- About 75–80% of the earth's air mass is found in the troposphere, the atmospheric layer closest to the earth's surface, where most living organisms exist.
- This layer extends only about 17 km above sea level at the equator and 8 km over the poles
- Temperature decreases with altitude, top part of troposphere is known as Tropopause. and temperature range of it 20 °C to - 56 °C

Stratosphere



• A stable layer above Troposphere is called a Stratosphere, which extends about 50-55 km above the surface of earth.

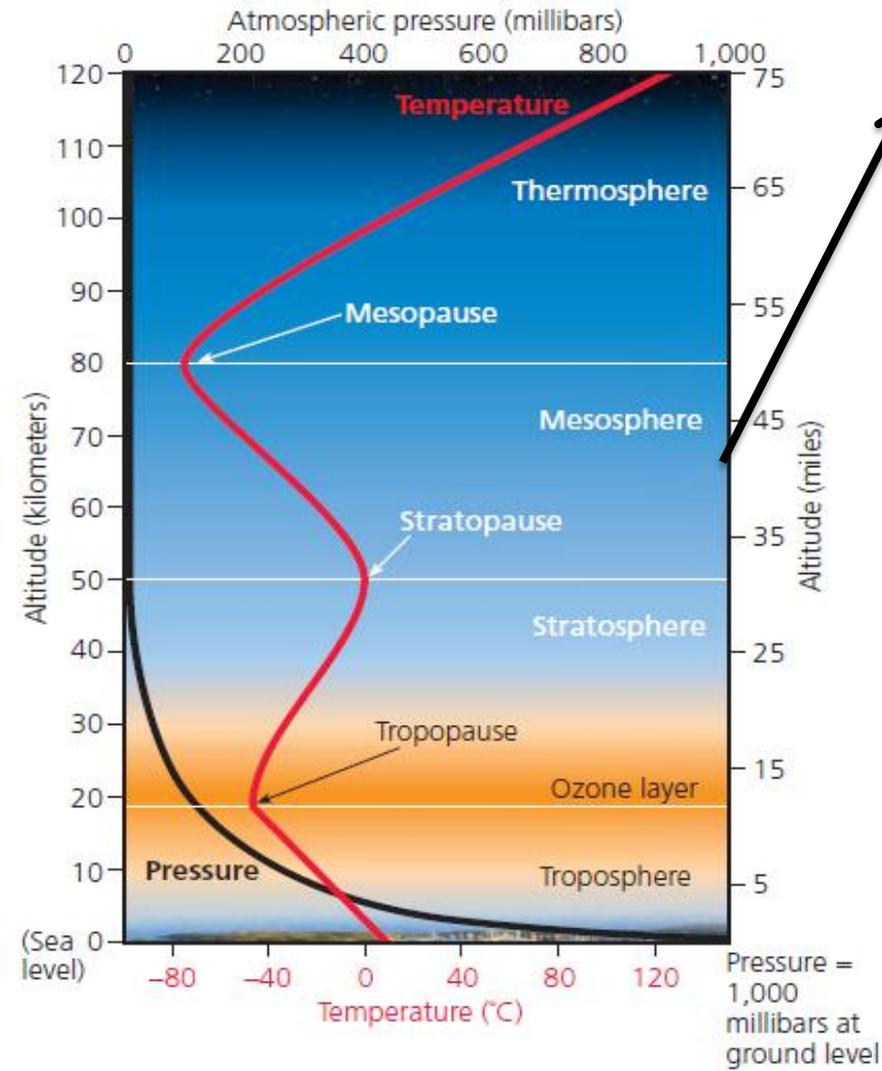
• It is known for presence of Ozone layer, which is found near about 20 – 25 Km above the surface of earth

• This layer is our protective layer which protect us from ultra violet radiations

• Because of absorption of ultraviolet radiation by ozone layer it raises the temperature of this layer up to -56°C to -2°C

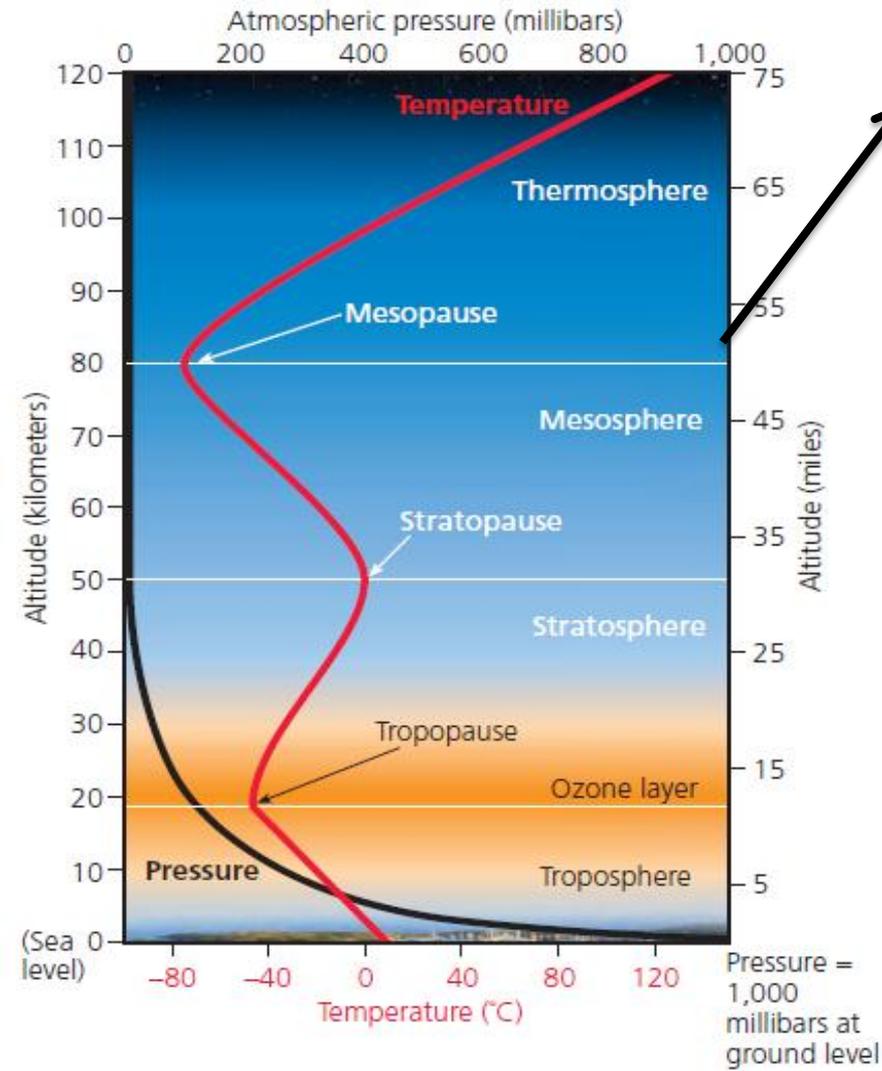
• top part of this layer is called a Stratopause

Mesosphere



- It exists over stratosphere and in this layer, temperature decreases with altitude because of low levels of ozone
- It absorbs ultraviolet radiation.
- layer between mesosphere and thermosphere is known as mesopause.
- It extended up to 50 km to 85 km and temperature range – 2 °C to – 92 °C

Thermosphere



- Thermosphere extends up to 500 km above earth's surface.
- Temperature rises in this zone with altitude
- Ionization of elements like oxygen and nitric oxide take place in the upper most portion of layer. Therefore, the upper layer of thermosphere is also called ionosphere
- Temperature range of this layer is near about -92°C to 1200°C .

National Ambient Air Quality Standards



S. No.	Pollutants	Time Weighted Average	Concentration in Ambient Air	
			Industrial, Residential, Rural and other Areas	Ecologically Sensitive Area (notified by Central Government)
1	Sulphur Dioxide (SO ₂), µg/m ³	Annual*	50	20
		24 Hours**	80	80
2	Nitrogen Dioxide (NO ₂), µg/m ³	Annual*	40	30
		24 Hours**	80	80
3	Ozone (O ₃), µg/m ³	8 hours**	100	100
		1 hours **	180	180
4	Carbon Monoxide (CO), mg/m ³	8 Hours **	2	2
		1 Hour**	4	4
5	Particulate Matter (Size <10µm) or PM ₁₀ µg/m ³	Annual*	60	60
		24 Hours**	100	100
6	Particulate Matter (Size <2.5 µm) or PM _{2.5} µg/m ³	Annual*	40	40
		24 Hours **	60	60
7	Lead (Pb), µg/m ³	Annual *	0.5	0.5
		24 Hour**	1	1

* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform interval.

** 24 hourly 08 hourly or 01 hourly monitored values.



Classification of Air Pollutants

- Air pollutants can be classified as under
 - Based on Origin
 - Based on States of matter

- **Classification based on origin of pollutants**

Depending upon the origin of pollutants, the air pollutants are classified as

- 1. Primary air pollutants*
- 2. Secondary air pollutants*

1. Primary Air Pollutants

□ Pollutants which are directly emitted from the sources to the atmosphere
primary air Pollutants.

e.g. Sulphur oxides (SO_x)
Nitrogen Oxides (NO_x)
Carbon Monoxide
Radio active materials
Particulate matter



FIGURE 21.1 This steel mill in Beijing, China, is a major source of air pollution.

2. Secondary Air Pollutants



□ Pollutants which are formed by chemical reactions among primary pollutants and atmospheric chemicals are known as Secondary Air Pollutants

e.g . Ozone
Sulphur Trioxide
Photo-chemical smog, etc.
Petroxacyl nitrate (PAN)
etc...





FIGURE 21.2 Burning sugarcane fields, Maui, Hawaii—an example of a fugitive source of air pollution.

Classification based on states of matter



Based on states of matter air is classified in two categories

- (1) Gaseous air pollutants
- (2) Particulate air pollutants

(1) Gaseous air pollutants

Pollutants which are found in the gaseous state at normal temperature and pressure are called gaseous air pollutants

e.g. Carbon monoxide (CO), Carbon dioxide (CO₂), Nitrogen oxides (NO_x)
Sulphur oxides (SO_x) etc.....

(2) Particulate air pollutants

Particulates are finely divided, air borne solid and liquid particles which remain for very long period of time in air.

e.g. Aerosols, Dust, Smoke, mist, fog,



- Aerosols : Air borne suspensions of solid or liquid particles smaller than 1 mm size e.g. dust, smoke, mist etc.
- Dust: It consists of small solid particles having a size of 1 to 200 mm
- Smoke : it formed by incomplete combustion of organic matter (wood) having a size of 0.1 to 1 micro meter
- Mist : it consists of liquid droplets of size around 0.1 t 1 micro meter raised due to condensation of vapours in the atmosphere
- Fog : If the mist is made of high concentration of water droplets which affect the visibility its known as fog.

Sources of air pollutants



PM (PARTICULATE MATTER)

Pm are finely divided air borne, solid and liquid particles which remains for very long time in air.

It is available in size range from 0.02 micrometer to 500 micrometer

Particulate matter (PM) is a complex mixture of suspended solid and liquid particle in semi equilibrium with surrounding gases.

Sources

- Volcanic eruptions
- Dust
- Storms
- Smoke from vehicles
- Agriculture burning



5	Particulate Matter (Size <math><10\mu\text{m}</math>) or PM_{10} $\mu\text{g}/\text{m}^3$	Annual*	60	60
		24 Hours**	100	100
6	Particulate Matter (Size <math><2.5\ \mu\text{m}</math>) or $\text{PM}_{2.5}$ $\mu\text{g}/\text{m}^3$	Annual*	40	40
		24 Hours**	60	60

LI MIN





Details of samples collected during the year 2014-15 are as under.

[Yearly average 2014-15]

S. No	City	LOCATION	PARAMETER			
			PM ₁₀	PM _{2.5}	SO ₂	NO _x
		National Ambient Air Standards	60	40	50	40

www.gpcb.gov.in/annual-report.htm



Gujarat Pollution Control Board
ISO-14001 Certified Organization

About Board Projects Environmental Clearance

STATISTICS
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 Annual Report

Annual Report 2014-15

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Annual Report 2013-14

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Gujarat Pollution Control Board
ISO-14001 Certified Organization

<http://cpcb.nic.in/RealTimeAirQualityData.php>

Details of samples collected during the year 2014-15 are as under.

[Yearly average 2014-15]

S. No	City	LOCATION	PARAMETER			
			PM ₁₀	PM _{2.5}	SO ₂	NO _x
		National Ambient Air Standards	60	40	50	40
22	Ahmedabad	Cadila, Narol	91	33	13.6	20.9
23		L.D.Engg. College	83	29	12.4	20
24		Shardaben Hospital	83	30	12.3	19.5
25		R.C.Tech.High School	84	30	12.3	19.4
26		Behrampura Referral Hospital	85	31	12.9	20.5
27		Bhagavathi Estate	93	37	13.8	21.1
28		Reliable Products	92	32	13.4	20.7
29	Rajkot	Nr. Sardara Corp. Amul Ind. Ltd.	89	32	13.3	20.3
30		Gpcb Office	82	31	12.3	19
31	Jamnagar	Nr. Fisheries Office	90	34	13.7	21.1
32	Morbi	Fire Station	90	32	13.7	20.9
33		Eagle	96	35	14	21
34	Bhuj	Mundra	84	30	13.2	20.4
35	Sarigam	Tristar Intermediates	88	30	13.8	21.2

* All parameter are express in $\mu\text{g}/\text{m}^3$



CITIES » DELHI

NEW DELHI, March 31, 2014

Updated: March 31, 2014 10:58 IST

Delhi has the worst air quality across India

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mathrubhumi.com/Yearbook2014

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BINDU SHAJAN PERAPPADAN

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INHALING TOXIC FUMES



● Particulate Matter (PM) is ever-present in the air and most of it is invisible to the naked eye. **Big PM are between 2.5 and 10 micrometers.** These particles are called PM10 and sustained exposure would cause adverse health effects.

● Delhi, Ludhiana, Kanpur, Lucknow and Indore rank in the top 20 most polluted cities according to Global PM10 World Health Organisation Urban outdoor air pollution database

● Sources of ambient air pollution include - transport, industrial and heating emissions, biomass burning and tobacco smoke

Like 5.3K +1 317 Share 38

Wednesday April 2, 2014 -- 22:43

Nanjing Air Pollution: Real-time Air Quality Index (AQI)

NANJING
南京

MAANSHAN
马鞍山

ZHENJIANG
镇江

YANGZHOU
扬州

WUHU
芜湖

TAIZHOUSHI
泰州

CHANGZHOU
常州

MORE CITIES

દિલ્હીમાં પ્રદૂષણના કારણે 'ઇમરજન્સી' જેવી સ્થિતિ : ૧૭૦૦ સ્કૂલ બંધ કરાઇ

- દિલ્હીની હવામાં ઝેરી તત્ત્વોનું પ્રમાણ હોવું જોઈએ એના કરતા ૪૦ ગણું

પંજાબ-હરિયાણામાં ખેતરો બાળવાના કારણે દિલ્હી 'ગેસ ચેમ્બર' બની ગયું, કેન્દ્ર હસ્તક્ષેપ કરે : કેજરીવાલ ગર્ભવતીઓ, નવજાત શિશુઓ અને ફેફસાની બિમારીથી પીડાતા દર્દીઓની સ્થિતિ અત્યંત બદતર (પીટીઆઈ) નવી દિલ્હી, તા. ૫ નવેમ્બર, ૨૦૧૬

આજે પ્રદૂષણના કારણે દિલ્હીની ૧૭૦૦ મ્યુનિસિપલ સ્કૂલો બંધ કરવાનો આદેશ કરવાની ફરજ પડી છે. છેલ્લાં ૧૭ વર્ષમાં નવી દિલ્હીનું હવાઈ પ્રદૂષણ ચરમસીમાએ પહોંચી ગયું છે. ખેતરોમાં બાળેલા પાક અને વાહનોના ધુમાડા તેમજ દિવાળી દરમિયાન ફૂટેલા ફટાટકડાના કારણે શિયાળામાં ભેજના કારણે દિલ્હીમાં માંડ ૪૦ મીટર દૂરનું દેખાતું પણ બંધ થઈ જાય છે.

દક્ષિણ દિલ્હી મ્યુનિસિપલ કોર્પોરેશનના

જણાવ્યાનુસાર, હાલ પૂરતી સ્કૂલો અચોક્કસ મુદત સુધી બંધ કરવામાં આવી છે. આશરે દસ લાખ બાળકોની સલામતી અને સુરક્ષા માટે આ નિર્ણય લેવામાં આવ્યો છે. ઓછી વિઝિબિલિટીના કારણે અકસ્માતોનું પ્રમાણ પણ ખૂબ જ વધી ગયું છે. હાલ દિલ્હીની હવામાં હોવા જોઈએ એના કરતા ૪૦ ગણા વધારે ઝેરી તત્ત્વો છે.



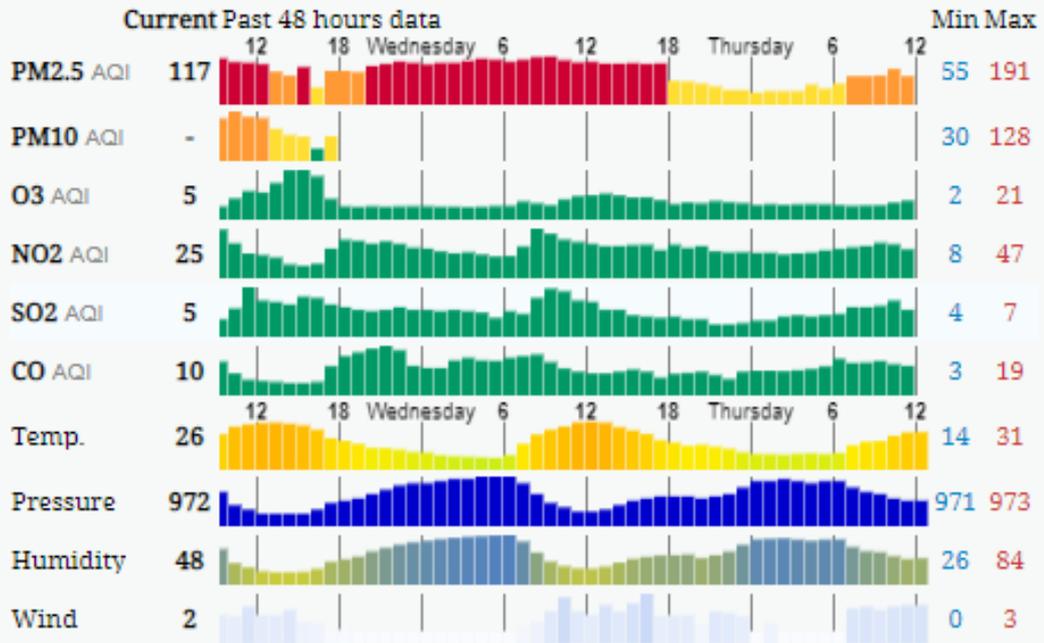


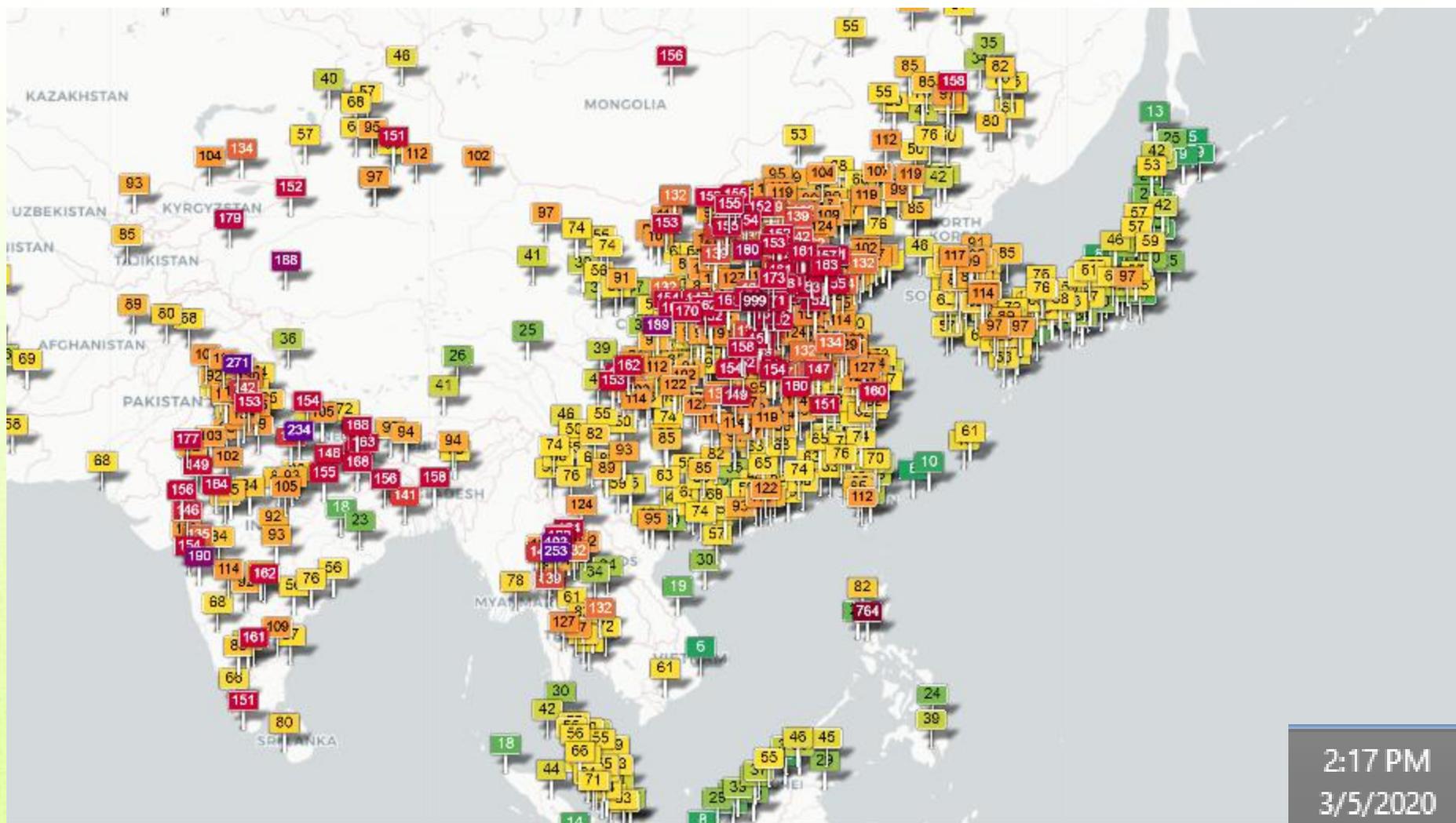
Mandir Marg, Delhi AQI: Mandir Marg, Delhi Real-time Air



117

Unhealthy
for Sensitive Groups
Updated on Thursday 12:00
Temp.: 26°C





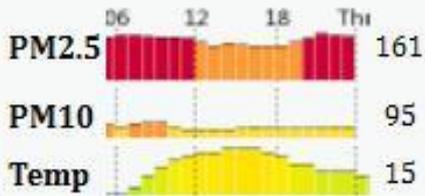


Maanshan Air Quality.

161

Unhealthy

Updated on Thursday 0:00

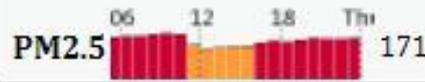


Yangzhou Air Quality.

171

Unhealthy

Updated on Thursday 0:00

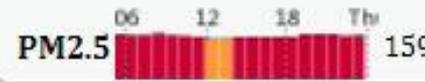


Taizhoushi Air Quality.

159

Unhealthy

Updated on Thursday 0:00

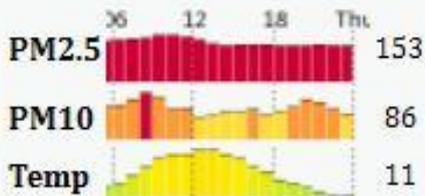


Zhenjiang Air Quality.

153

Unhealthy

Updated on Thursday 0:00



Wuhu Air Quality.

184

Unhealthy

Updated on Thursday 0:00



Changzhou Air Quality.

159

Unhealthy

Updated on Thursday 0:00



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City Monitoring Station, Shì xiáqū, Zhengzhou AQI:  

999

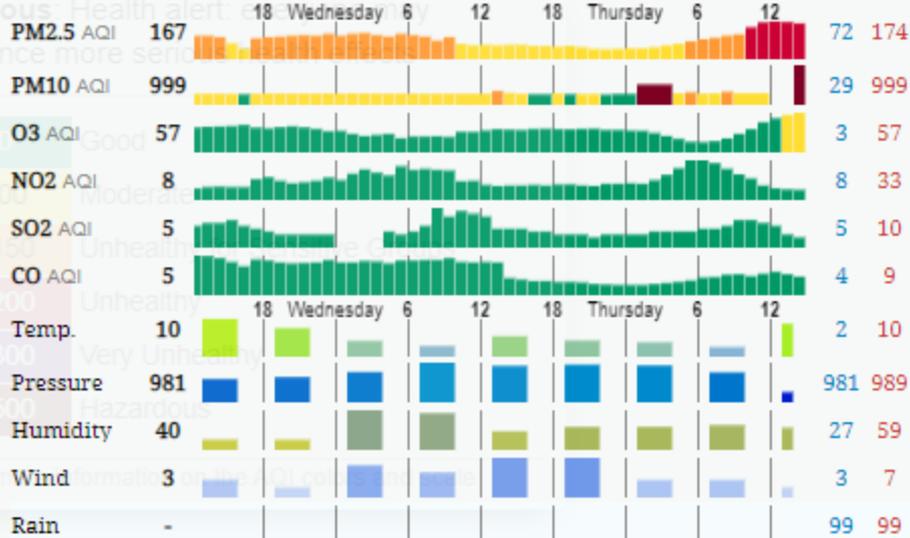
Hazardous

Updated on Thursday 15:00

Primary pollutant: **pm10**

Current Past 48 hours data

Min Max



Gōngshāng college, Linfen AQI: Gōngshāng college, Linfen Real



451

Hazardous

Updated on **Wed. 13:00**

Primary pollutant: **pm10**

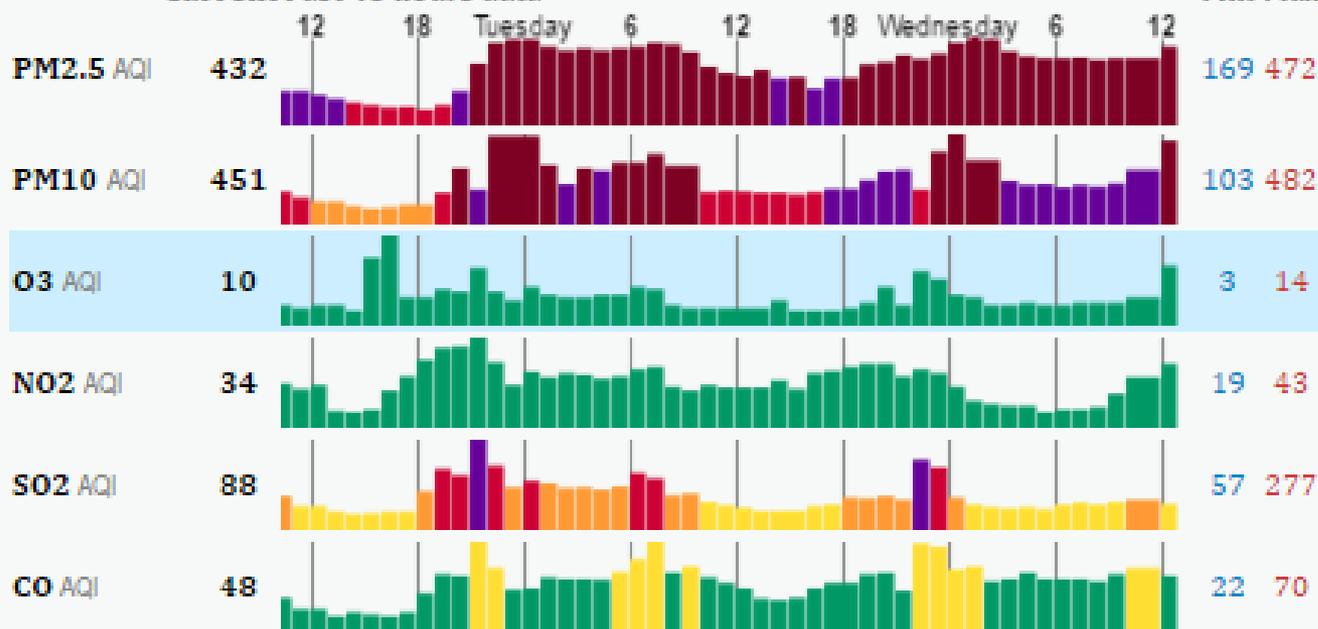
Current Past 48 hours data Min Max

30/11/16

Weather Information

Current Past 48 hours data

Min Max



Maninagar, Ahmedabad AQI: Maninagar, Ahmedabad Real-time



235

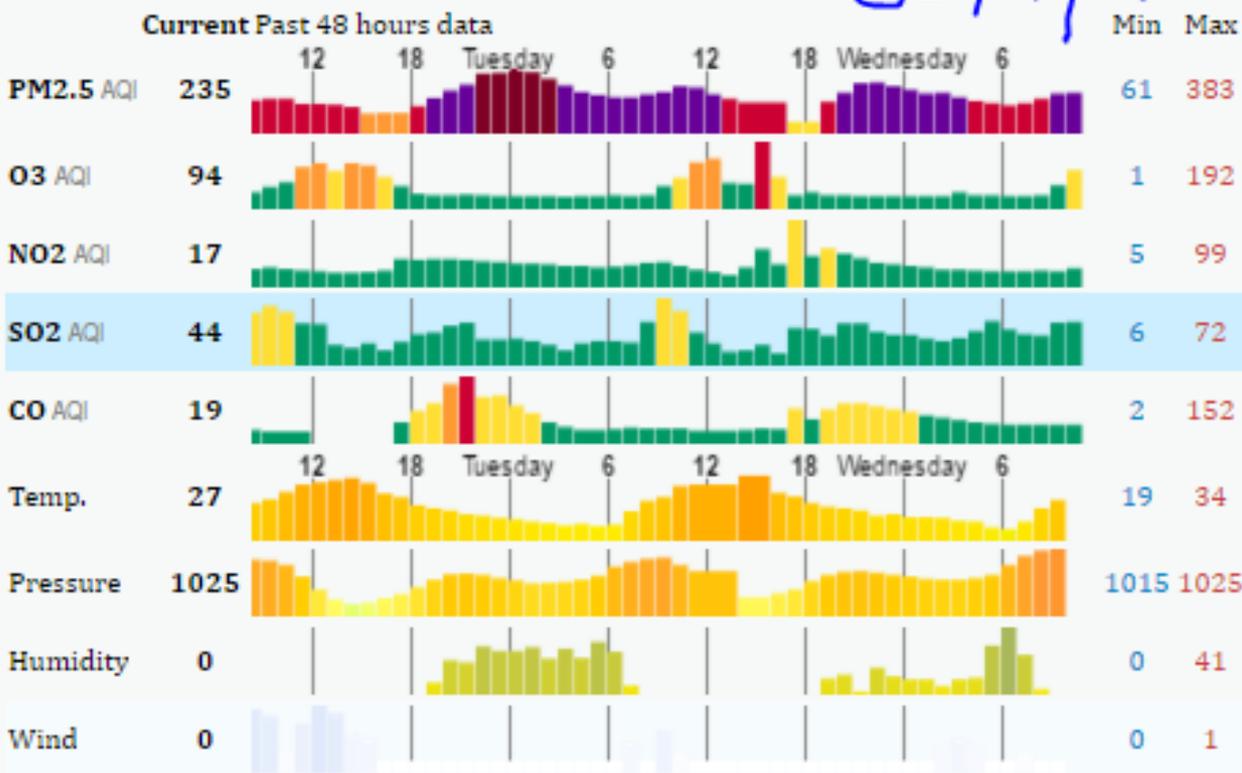
Very Unhealthy

Updated on Wed. 11:00

Temp.: 27°C

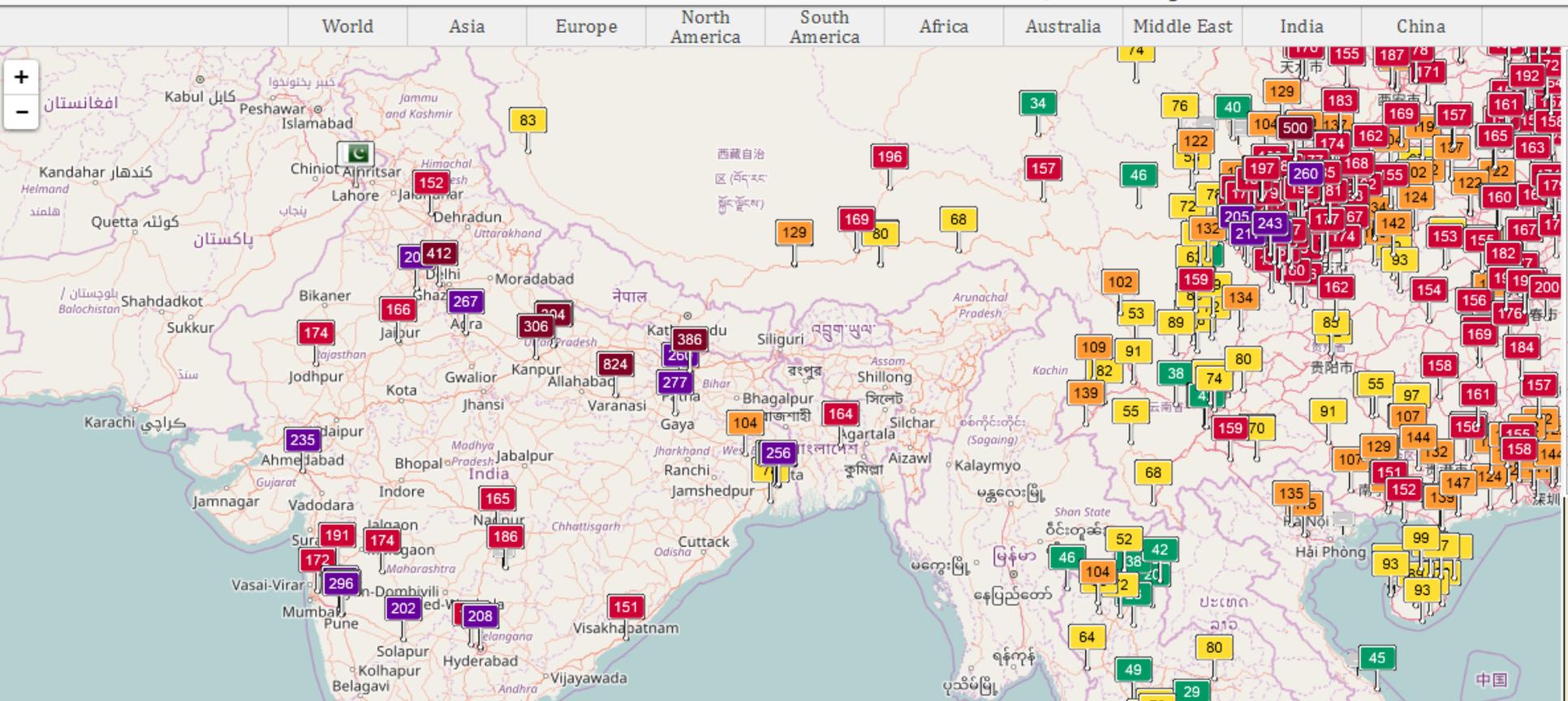
30/11/16

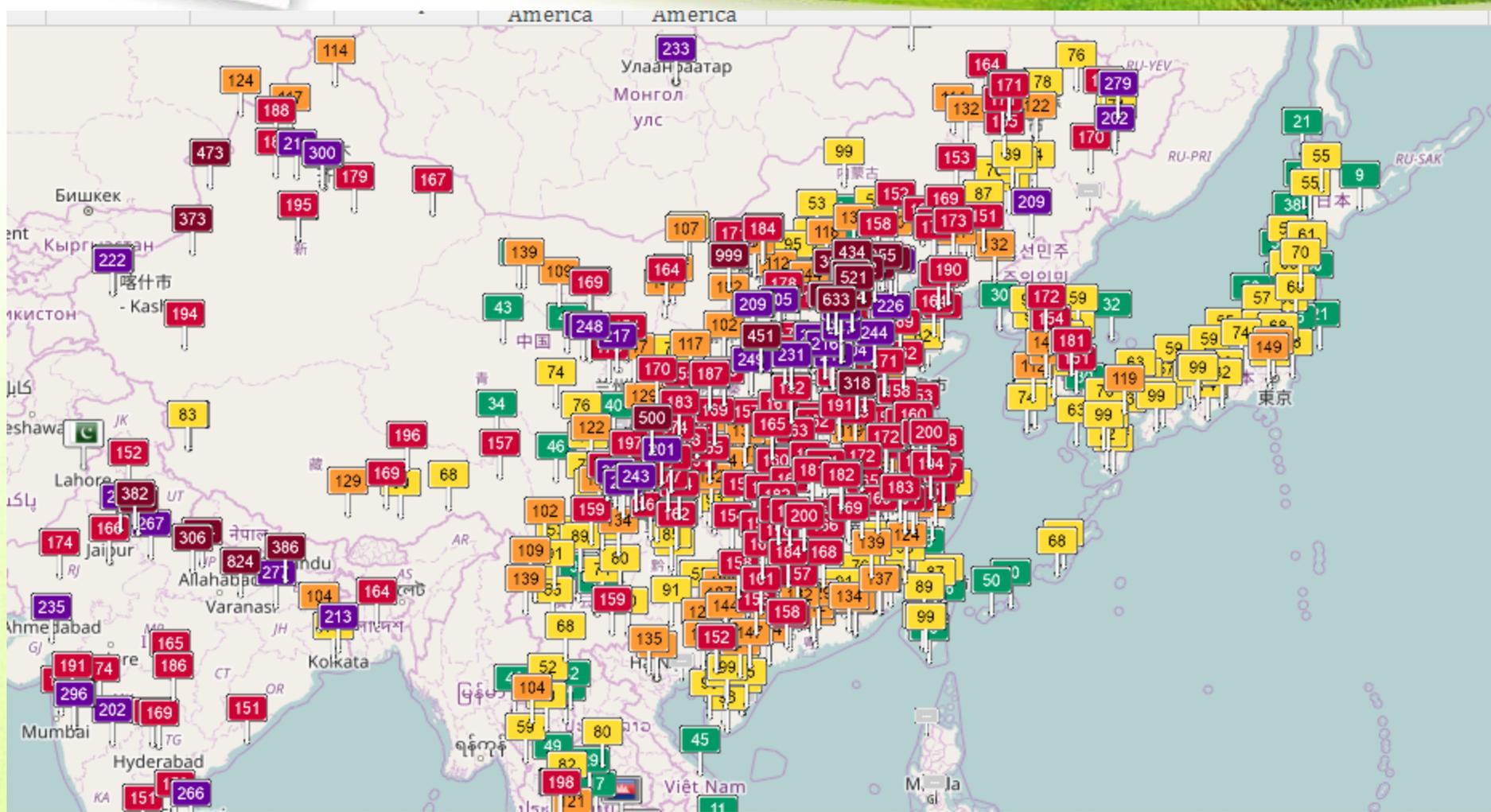
Current Past 48 hours data





Air Pollution in India: Real-time Air Quality Index Visual M





Punjabi Bagh, Delhi AQI: Punjabi Bagh, Delhi Real-time Air Quali



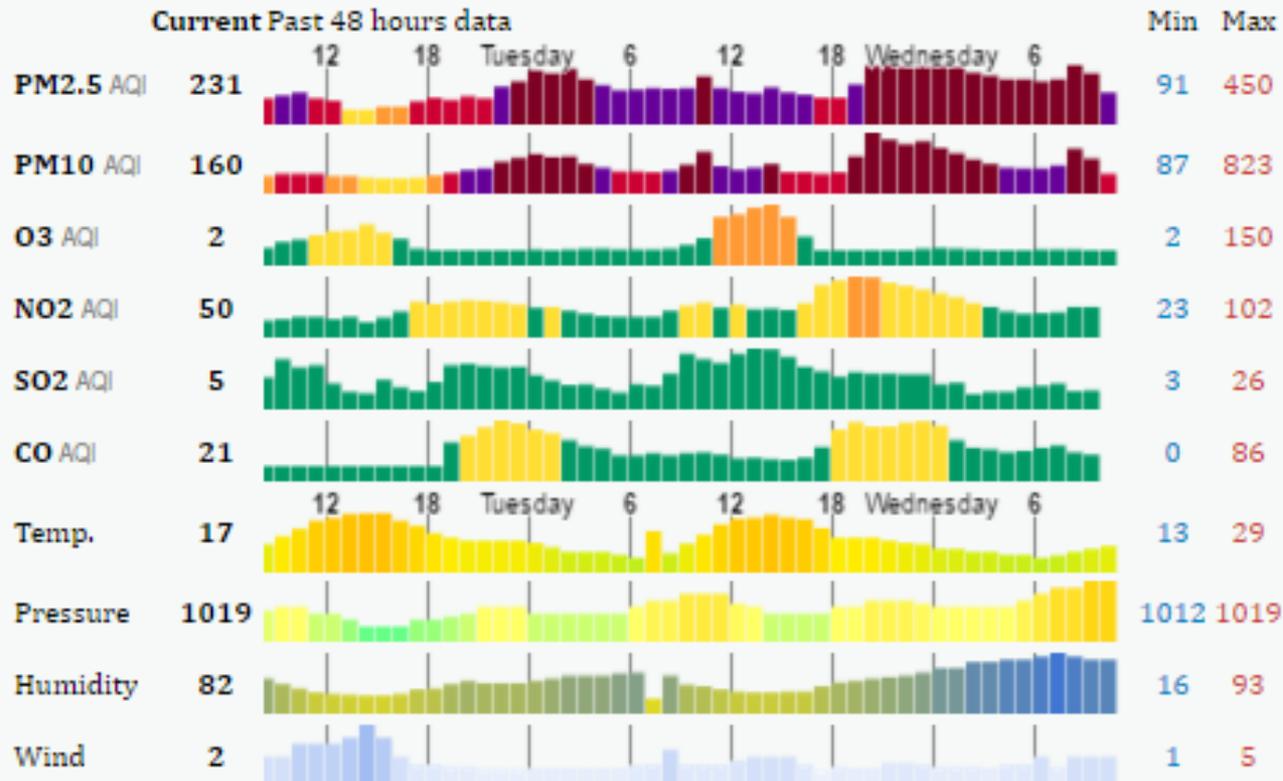
231

Very Unhealthy

Updated on Wed. 11:00

Temp.: 17°C

Current Past 48 hours data







❖ Particulate matter is divided in two categories

- (1) *Particulate Matter 2.5 ($PM_{2.5}$, size $\leq 2.5\mu m$), fine fraction size up to $2.5\mu m$,*
- (2) *Particulate Matter 10 (PM_{10} , size $\leq 10\mu m$)*

NATURAL SOURCES

- Coarse particles are produced by the mechanical break-up of larger solid particles.
- Wind blown dust such as road dust, fly ash, soot, agricultural processes
- physical processes of crushing, grinding and abrasion of surfaces.
- Non-combustible materials released when burning fossil fuels.

Anthropogenic

- Road traffic emissions particularly from diesel vehicles
- Industrial combustion plants some public power generation
- Commercial and residential combustion
- Non-combustion processes (e.g. quarrying)
- agricultural activities



Effects due to PM

- Cardio-pulmonary problems i.e. hypertension, stroke and coronary heart **disease**
 - * irregular heartbeat cardiopulmonary disorder
- Visibility reduction
- Respiratory symptoms such as irritation of the airways, coughing, or difficulty breathing
- Decreased lung function
- Asthma
- Chronic bronchitis
- Premature death in people with heart or lung disease

Sulphur dioxide (SO₂)



SO₂ is the chemical compound produced by volcanoes and in various industrial processes

SO₂ is colourless, nonflammable, and nonexplosive gas which may impart suffocation

SO₂ forms H₂SO₃ in the air

Natural Sources

- Volcanos (67%)

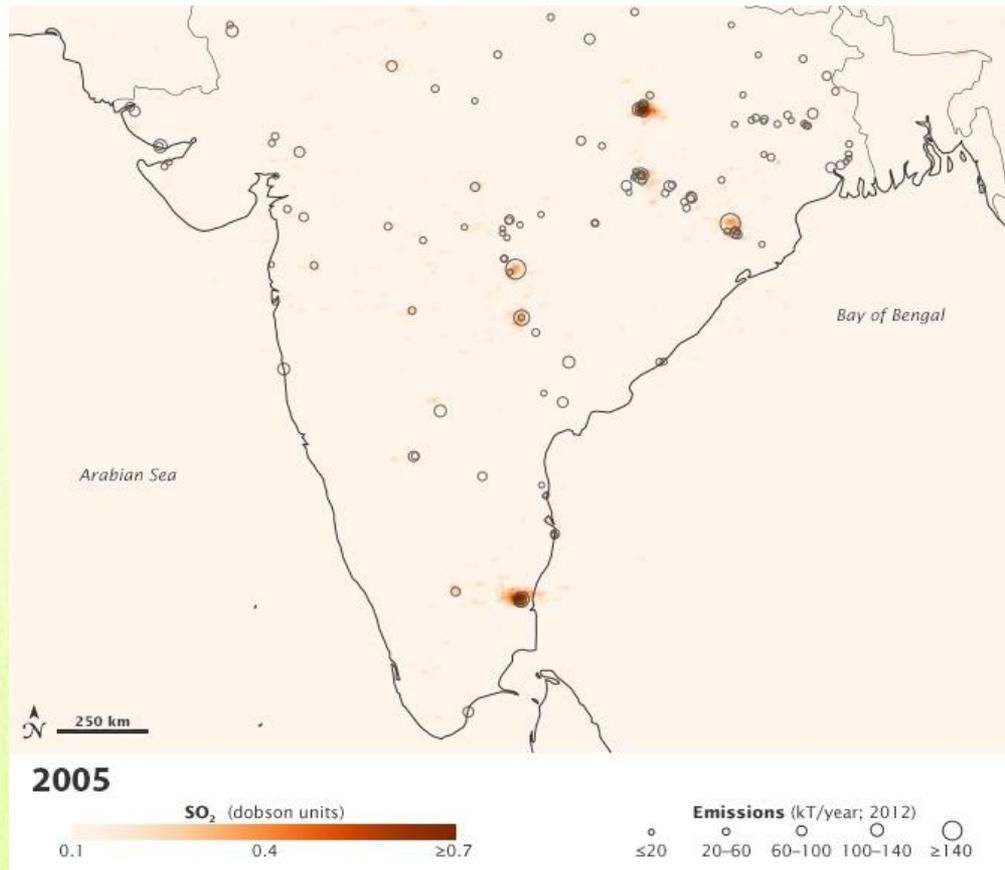
Anthropogenic

- combustion of fossil fuel (coal, heavy fuel oil in thermal power plants, office, factories)
- paper Industry
- extraction & distribution of fossil fuels
- smelting of metals (sulfide ores to produce copper, lead and zinc)
- Petroleum refining
- combustion process in diesel, petrol, natural gas driven vehicles

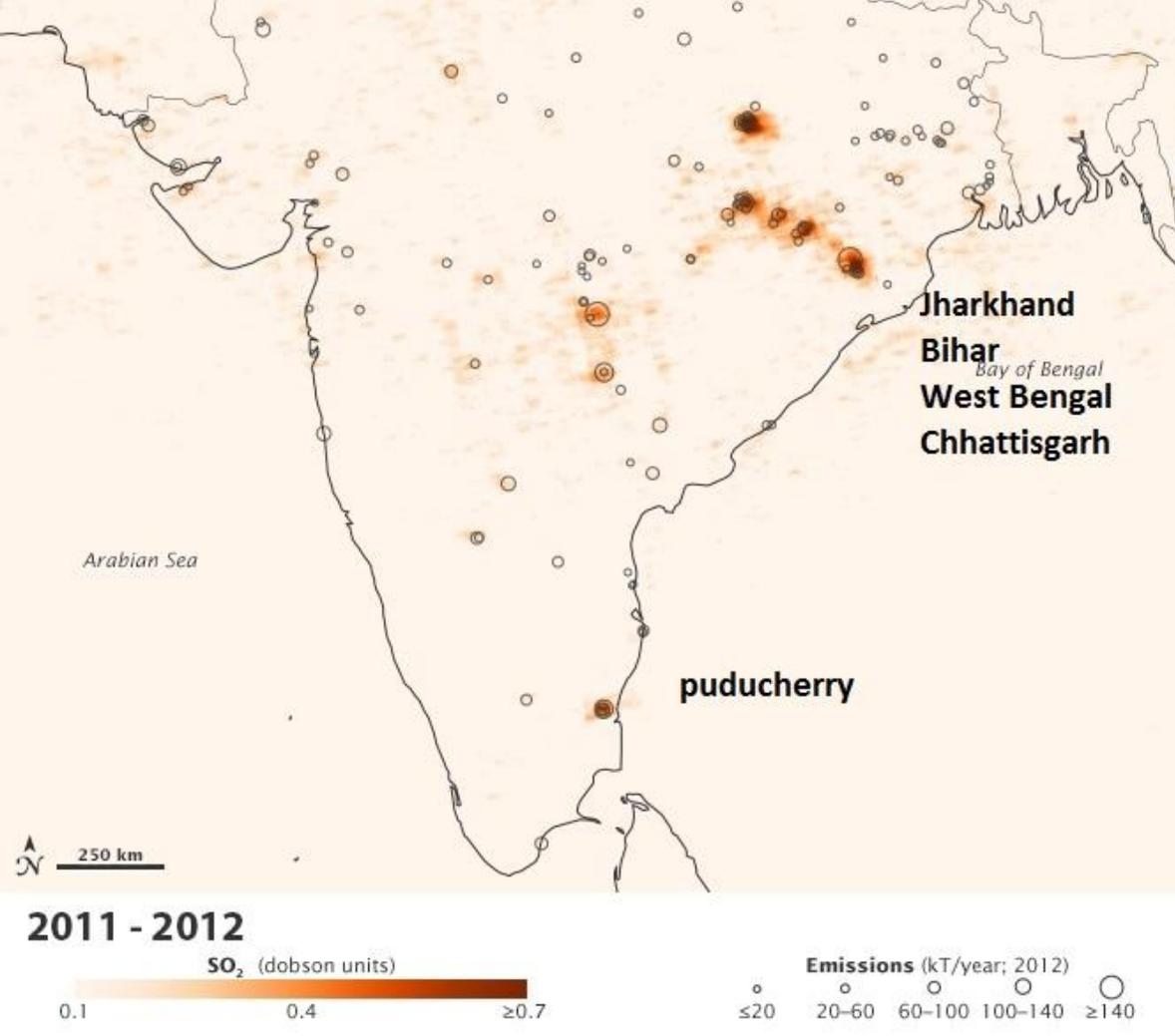


NASA Satellite Sees Increase of India's Sulfur Dioxide Emissions

December 19, 2013



<http://www.nasa.gov/content/goddard/nasa-satellite-sees-increase-of-indias-sulfur-dioxide-emissions/#.Uzzn7KLeTxR>



These maps show average sulfur dioxide levels measured by the Aura satellite for the periods 2005 (top) and 2011-2012 (bottom) over India.

The black circles represent the locations of many of India's top sulfur dioxide emissions sources in 2012. Larger dots indicate greater emissions.

Image Credit: NASA's Earth Observatory



Effects of Sulphur dioxide (SO₂)

- Respiratory illness*
- Visibility destruction*
- Aggravate existing heart and lung diseases*
- Acid rain*
- Aesthetic damage*

Oxides of Nitrogen (NO_x)



Oxides of nitrogen are a generic term for a group of highly reactive gases that contain nitrogen and oxygen in varying amounts.

NO_x are emitted as nitrogen oxide (NO) which is rapidly oxidized to more toxic nitrogen dioxide (NO_2)

Nitrogen dioxide (NO_2) is a reddish-brown toxic gas with a characteristic sharp, biting odor and is a prominent air pollutant.



Natural Sources

- Lightning
- Forest fires
- Bacterial activity of soil

Anthropogenic

- High temperature combustion (internal combustion engines, fossil fuel fired power stations, industrial)
- Burning of Bio-mass and Fossil Fuels

Effects of Nitrogen Oxides (NO_x)



- Irritates the nose and throat
- Increase susceptibility to respiratory infections
- It may affect lungs and cause bronchitis

“NO” combine with hemoglobin and reduces the oxygen carrying capacity of blood.

Reduces the visibility



Mahesh Chandra Mehta

Mahesh Chandra Mehta is a public interest attorney from [India](#).



***Petition (Civil) No.13029/1985 in
the matter of M.C. Mehta Vs.
Union of India***



Awards

1. UNEP GLOBAL 500 AWARD 1993.
2. THE GREAT SON OF THE SOIL Award 1993.
3. THE GOLDMAN ENVIRONMENTAL PRIZE for Asia (1996)
4. RAMON MAGSAYSAY Award for Asia for Public Service (1997)
5. ROTARY MANAV SEVA Award, 1997.
6. SEVA SHREE SAMMAN, 1997 for Social and environment work
7. VASUNDHARA, 1997 by Rotary Club of Dombivali Midtown.
8. PEOPLE OF THE YEAR Award 1998, LIMCA Book of Record.
9. KERRY RYDBERG AWARD for environmental activism, 1998 from Public Interest Environmental Law Conference, U.S.A.
10. He was a Keynote Speaker at various International Conferences on Environmental Law and Human Rights held at USA, Russia, UK, Zimbabwe, Sri Lanka, Nepal, Pakistan, Philippines, Thailand, Israel, Japan, Italy, Bhutan, Bangla Desh, South Africa, Australia and Canada.^[2]



CASES

- TAJ MAHAL CASE
- DELHI SEWAGE TREATMENT PLANT CASE
- GANGES POLLUTION CASE
- CHILD LABOUR CASE
- VEHICULAR POLLUTION CASE
- ENVIRONMENTAL AWARENESS AND EDUCATION CASE

- DUST POLLUTION CASE
- COASTAL AREAS CASE
- ANTOP HILL CASE
- GROUND WATER POLLUTION CASE
- GROUND WATER DEPLETION CASE
- GAMMA CHAMBER CASE

KAMAL NATH CASE



WIKIPEDIA
The Free Encyclopedia

Himachal Pradesh



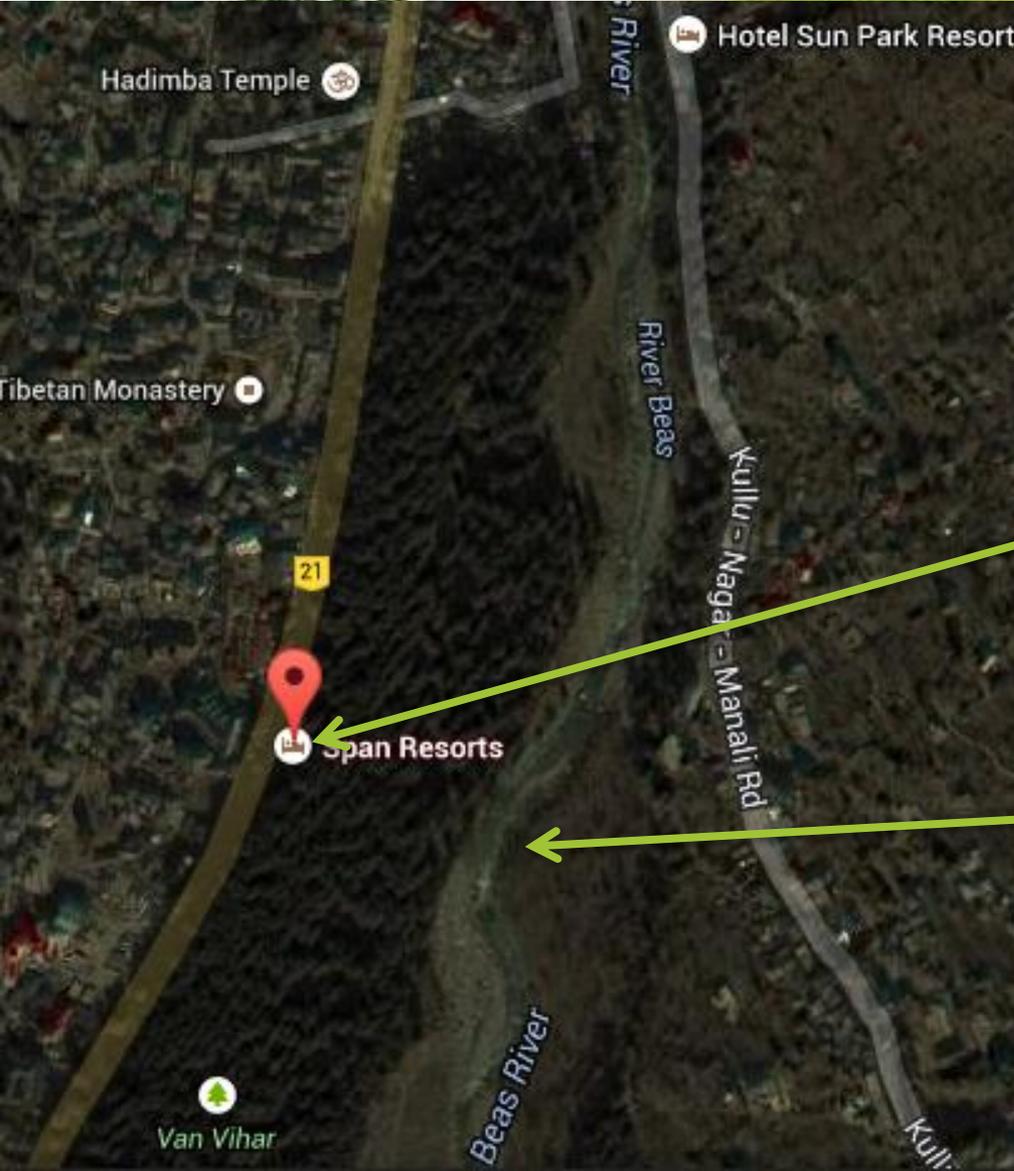
Span motel (The family members of Shri Kamal Nath)

Shri Kamal Nath
Minister for Environment and Forests, Govt. of India

“Diverted the Course of river Beas to beautify the motel and also encroached upon some forest land”

A landmark judgment for the first time in India.

The Court said that polluter must pay to reverse the damage caused by his act and imposed a fine of Rs Ten Lakhs (Rs 10,00,000) on the Span motel as exemplary damages



Span Resorts

River Beas



Particular Pollution in Delhi
 How the Exhaust Emission Standards affects on Human Health
 C.C. Certificate
 Steps Taken by Delhi Govt. to reduce the Pollution in Delhi
 Supreme Court Direction
 Alternate Fuel to Control the pollution
 Refined Petroleum
 Pollution checking centers
 Application invited for fitment center.

Directions of the Hon'ble Supreme Court for control of Pollution in Delhi .

Hon'ble Supreme Court has issued several directions for control of vehicular pollution in Delhi in the Writ Petition (Civil) No.13029/1985 in the matter of M.C. Mehta Vs. Union of India. These directions and the time frame for their completion are given below:

S No.	Direction	Time Frame
1.	Strict Enforcement of restriction on plying of goods vehicles during the day time	15-08-1998
2.	Elimination of leaded petrol from Delhi	01-09-1998
3.	Phasing out/ban on plying of old commercial/transport vehicles	02-10-1998
	(i) Vehicles more than 20 years old	15-11-1998
	(ii) Vehicles more than 17 years old (iii) Vehicles more than 15 years old	31-12-1998
4.	Ban on supply of loose 2T oils	31-12-1998
5.	Supply of only pre-mix petrol to 2-stroke engine vehicles	31-12-1998
6.	Establishment of two Independent Fuel Testing Labs	01-06-1999
7.	Only non-Commercial vehicles complying with EURO-I norms to be registered in NCR	01-06-1999
8.	Only non-commercial vehicles complying with EURO-II Norms to be registered in NCR	01-04-2000
9.	Comprehensive Inspection & Maintenance facilities to be started by transport Department and Private Sector	31-03-2000
10.	New ISBT to be built at Delhi's North and South-West Borders (to avoid pollution due to entry of inter-state buses)	31-03-2000
11.	Replacement of all pre-1990 autos and taxis with new vehicles using clean fuel	31-03-2000



Latest News

- Advertisement of Walk in Interview for SR in BSA Hospital
- An Approach to 12th Five Year Plan 2012-17
- Category and Circle Wise list of Ration Cards attached to FPS.
- Delhi Geo-Spatial Data Infrastructure Act, 2011
- Guideline for Website Security
- Public Notice for National Food Security Ordinance 2013
- Walk-in Interview for Sr or Jr Forensic or Chemical Examiner in FSL Delhi on contractual basis

Local Services

Important Links



Ⓢ *The Uttar Pradesh Pollution Control Board, Lucknow had recently reported in its comparative pollution study report that Kanpur was the most polluted city of the state.*

Ⓢ *The respiratory suspended particulate matter (RSPM) levels have exceeded three folds than its permissible limit.*

Ⓢ *The noise pollution levels outside hospitals (sensitive zone) have been surprisingly higher than the commercial and industrial zones.*



Kanpur, the most polluted city of state

TNN | Jun 5, 2009, 10.13PM IST

Thank You

Reference:

https://www.allianz.com/en/about_us/open-knowledge/topics/environment/articles/100818-20-pollution-disasters-past-present-and-future.html/#!/m74f5fe11-733d-414d-ae6a-990c6ce6ab54

