

ISSN 1880-8468

**Technical Report of  
International Development Engineering**  
国際開発工学報告

TRIDE-2008-01

**January 31, 2008**

**Pollution and Environment**

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<http://www.ide.titech.ac.jp/TR>

# Pollution and Environment

## 汚染と環境

東京工業大学  
教授 持丸義弘

要旨：2007年10月24日に大韓民国慶南晋州市の慶尚大学校 工科大学 機械航空工学部にて行った特別講演「汚染と環境」をまとめたものである。今回は大気汚染に主眼を置いている。人工起源で文明の象徴とかつては考えられていた煙突からの黒煙のさまざまな過去の実証事実、自然起源の火山灰、黄砂等のさまざまな実態、最近の大気汚染現況の3部からなっている。それぞれについて日本に限定せず、世界から事実を収録し、環境問題への意識提起の一つとする。

# Pollution and Environment

Delivered at the special lecture,  
Gyeongsang National University, Korea  
on October 24, 2007

by Prof. Yoshihiro Mochimaru,  
Dept. of International Development Engineering,  
Graduate School of Science and Engineering,  
Tokyo Institute of Technology



*By the courtesy of Prof. Myung-whan BAE,  
Gyeongsang National University, Korea*

## Pollution and Environment

Yoshihiro MOCHIMARU  
Tokyo Institute of Technology  
Presented at Gyeongsang National University  
Korea, on October 24, 2007

## Pollution

### From Artificial Sources



多布施公儀御石火矢鑄立方図

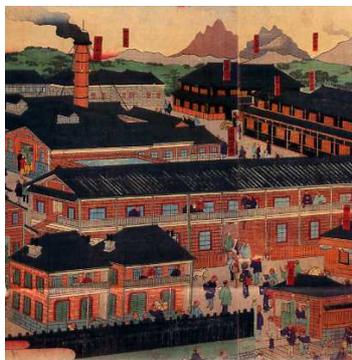
<http://kjs.nagaokaut.ac.jp/HistGallery/html/p1850.html>

## The Railroad



Designed and built by Peter Cooper in 1830 .

<http://www.longwood.edu/history/Teacher%20Prep/Industrial/industrialrevolution.htm>



錦絵「上州富岡製糸場図」,  
1872 (群馬県立日本絹の里)

National  
Tomioka  
Silk Factory,  
(1872)

From 富岡製糸場と絹産業遺産群,群馬県世界遺産推進室



1873年 深川セメント工場

Fukagawa Cement Factory  
[http://kjs.nagaokaut.ac.jp/HistGallery/html/p1873\\_4.html](http://kjs.nagaokaut.ac.jp/HistGallery/html/p1873_4.html)



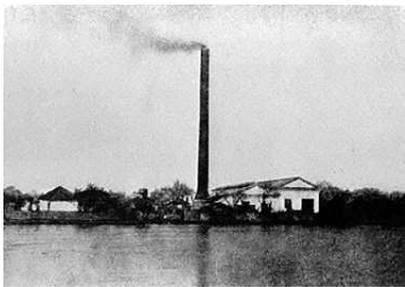
229 琵琶湖通運の蒸気船 (汽船湖氷丸)

琵琶湖通運の蒸気船(1880年頃)  
 明治大正図誌12, p.71, 筑摩書房, 1979

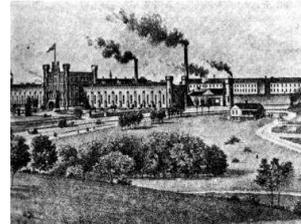


North Chicago Rolling Mill , 1882

<http://www.neiu.edu/~reseller/ehpg8usirqst.htm>

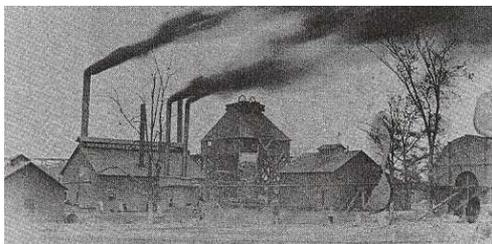


1883年 東京電灯会社設立  
[http://www.city.kamaishi.iwate.jp/rekishikan/va\\_09.html](http://www.city.kamaishi.iwate.jp/rekishikan/va_09.html)



Scenes from the Kansas State Penitentiary, Lansing, a sketch of the prison from its Seventh Biennial Report (1889-1890).

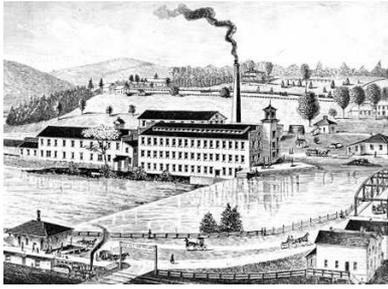
[http://www.kshs.org/publicat/khq/1977/77\\_3\\_hougen.htm](http://www.kshs.org/publicat/khq/1977/77_3_hougen.htm)



Pekay Coal Mine, 1892 Lucas County, Iowa ,USA  
<http://iagenweb.org/monroe/pekay.htm>

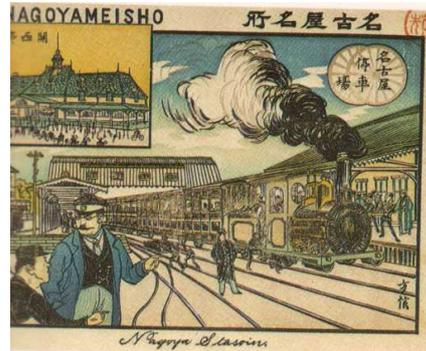


朝鮮改革談判図 橋本周延筆 明治27年(1894)  
<http://f48.aaa.livedoor.jp/~adsawada/siryou/060/resi060.html>



Early Industrial Plant (US)

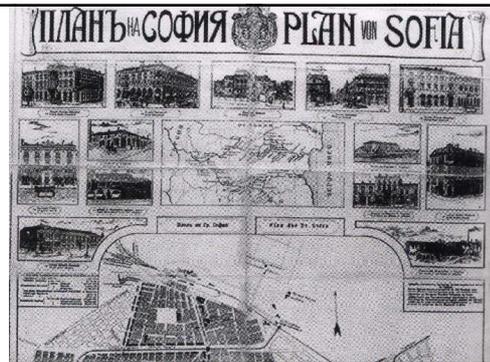
[http://encarta.msn.com/media\\_461530293/Early\\_Industrial\\_Plant.html](http://encarta.msn.com/media_461530293/Early_Industrial_Plant.html)



名古屋名所, 1899年, 明治大正図誌9, p.102, 筑摩書房, 1978



熱田名所, 1899年頃, 明治大正図誌9, p.103, 筑摩書房, 1978



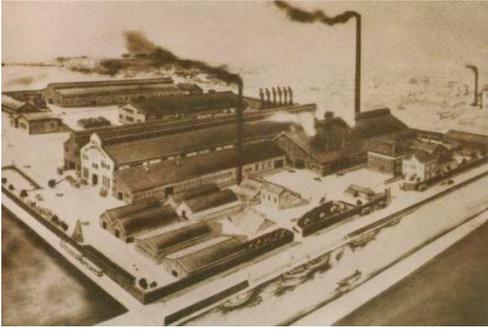
АТАНАС КОВАЧЕВ, София. План на града от 1903 г. ЗЕЛЕНАТА СИСТЕМА НА СОФИЯ p.82, Pensoft, (2001). <Green System of Sofia>



Jacques-Gerard Milbert. "Walet [sic] works on the Schuylkill river." Pennsylvania <http://www.philaprintshop.com/fairmount.html>



仁川濟物浦 (제물포) と月尾島 (월미도) 1910年5月刊 東洋拓殖株式会社刊「事業概況」 <http://f48.aaa.livedoor.jp/~adsawada/siryou/060/resi036.html>



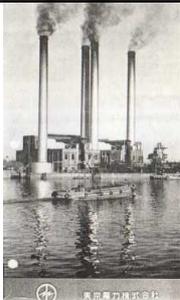
太同電気製鋼所熱田工場, 1915年頃. 明治大正図誌9, p.119, 筑摩書房, 1978



釜石

田中鉱山株式会社全景(大正6年) 1917年

[http://www.city.kamaishi.iwate.jp/rekishikan/va\\_09.html](http://www.city.kamaishi.iwate.jp/rekishikan/va_09.html)



たかだしずえ著  
蒼天ボックス3

<http://www.geocities.jp/hasu58/sepia/obake/obake.htm>

東京電力千住火力発電所

建設: 1925年 大正15年1月

<http://www.adachi.ne.jp/users/senjusun/obakeentotu.htm>



隅田川, アサヒグラフに見る昭和の世相一, p.155(1929年), 朝日新聞社, 1977

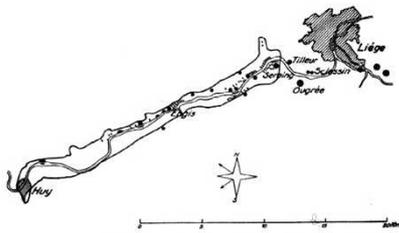
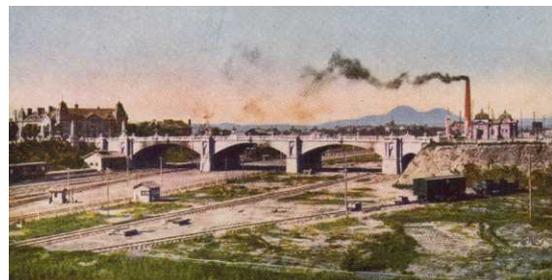


FIG. 1.—Sketch-map of the Meuse valley between Liege and Huy, schematized according to Mage and Batta (2) and Batta, Firket and Leciere (3). The continuous line borders the area in which the cases occurred.  
● signifies industrial establishments. † indicates deaths. Limits of the wind direction on the days of the disaster are shown by compass points.

The Fog Disaster in the Meuse Valley (Belgium), 1930:

<http://www.fluoridealert.org/meuse.htm>

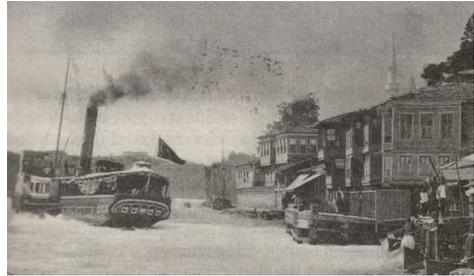


大連日本橋(絵葉書);

The Nihonbashi Bridge, Dairen



青島発電所(絵葉書)Qingdao Power Plant



Istanbul: Pamuk, p.334,  
Gallimard, (2007) ,by Ara Güler



Istanbul: Pamuk, p.67,Gallimard,  
(2007) by Selahattin Giz



Pennsylvania,  
USA

This is what Donora looked like at noon on Oct.  
29, 1948, as a deadly smog created by a  
temperature inversion and industrial plant  
emissions enveloped the town.

<http://www.post-gazette.com/magazine/19981029smog1.asp>



Ihara,  
Okayama

岡山県井原市

備中繊維の事務所と工場, 1955頃

<http://www.ibara.ne.jp/~kurakake/omoide.html>



九州電力発電所, 写真で見る  
日本11. p.25, 世光社, 1957



1958年頃の高浜市

<http://www.katch.ne.jp/~shin9007/hp-13/hp-13.html>



常滑 :最後の窯焚きの煙

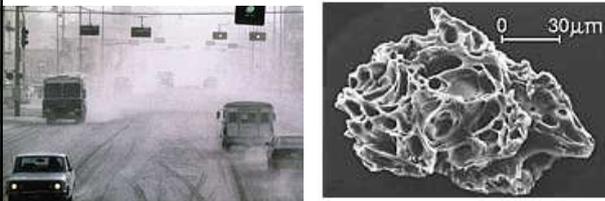
<http://www.e-tokoname.com/entotsu.htm>

Pollution  
From Natural Sources



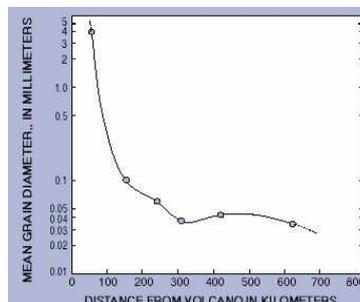
Stamp of New Zealand

<http://www.iomoon.com/ngauruhoe.html>



Ash from Mount St. Helens—  
Yakima, Wash., May 1980.

<http://pubs.usgs.gov/fs/fs027-00/>



Mount St. Helens (Sarna-Wojcicki and others, 1981) for the eruption on May 18, 1980

Mean diameter of ash particles with increasing distance from Mount St. Helens volcano.

<http://volcanoes.usgs.gov/ash/properties.html>



Darker, more ash-rich portion of plume penetrates cloud layer. 1980 Eruption of Mount St. Helens

<http://www.fs.fed.us/gpnf/mshnvm/education/teachers-corner/library/pre-eruption-0329.shtml>



Plinian column (ash plume) exploding over rim of crater, May 18, 1980. (U.S. Geological Survey, Don Swanson) Mount St. Helens  
<http://volcano.und.nodak.edu/vwdocs/msh/mov/mov.html>

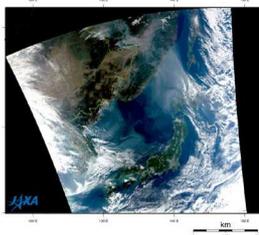


1989年8月21日噴火の降灰(桜島)  
<http://www.dpri.kyoto-u.ac.jp/~kazan/sakurajima/ashfall.html>



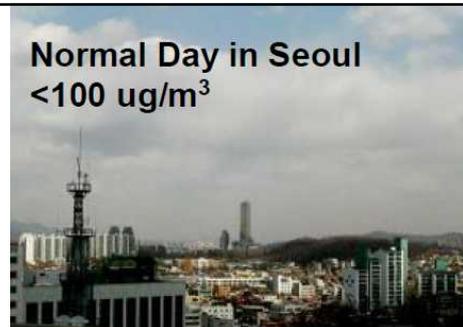
April 21, 1998

12 missing after dust storm in China  
<http://www.cnn.com/WORLD/asiapcf/9804/21/china.dust.storm/>



2004年10月17日午後1時ころ観測  
中国とロシアの火災の煙、日本海を渡って北海道へ

[http://www.eorc.nasda.go.jp/imgdata/topics/2004/img/tp041018\\_01.jpg](http://www.eorc.nasda.go.jp/imgdata/topics/2004/img/tp041018_01.jpg)



Normal Day in Seoul  
<math><100 \text{ ug/m}^3</math>  
[http://www.usfk.mil/usfk/hot\\_topics:YellowSandInfoCard.pdf](http://www.usfk.mil/usfk/hot_topics:YellowSandInfoCard.pdf)

**A Yellow Sand Day in Seoul**  
 $>1000 \text{ ug/m}^3$

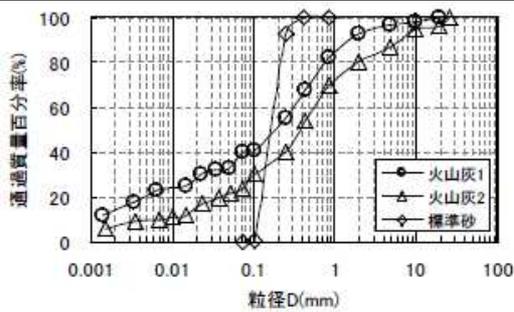


[http://www.usfk.mil/usfk/hot\\_topics:YellowSandInfoCard.pdf](http://www.usfk.mil/usfk/hot_topics:YellowSandInfoCard.pdf)



April 2,  
2007

**NAGOYA** -- Huge clouds of yellow sand carried on strong winds from China covered areas of western Japan on Monday, reducing visibility and coating buildings with dust.  
[http://www.gaijinpot.com/read\\_news.php](http://www.gaijinpot.com/read_news.php)



粒径加積曲線(北海道の火山灰土,  
北海道開発土木研究所)

[http://www.hkd.mlit.go.jp/topics/gijyutu/pdf\\_files/04douro/dou-17.pdf](http://www.hkd.mlit.go.jp/topics/gijyutu/pdf_files/04douro/dou-17.pdf)



桜島火山  
 屋の爆発映像

<http://www.dpri.kyoto-u.ac.jp/~kazan/kazan.html>

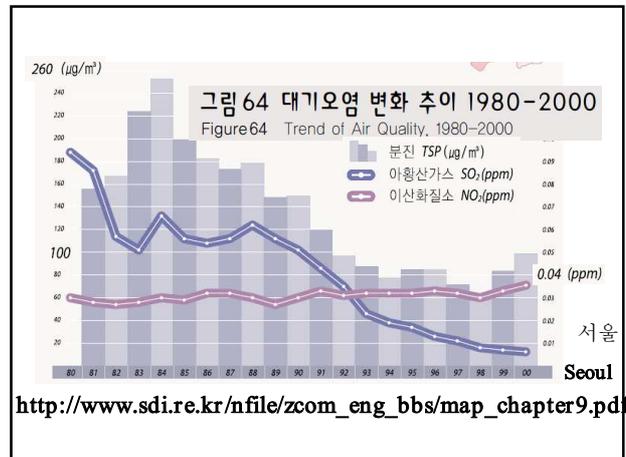
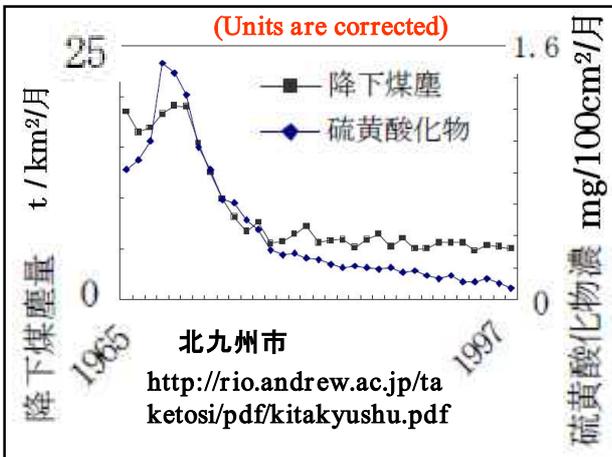
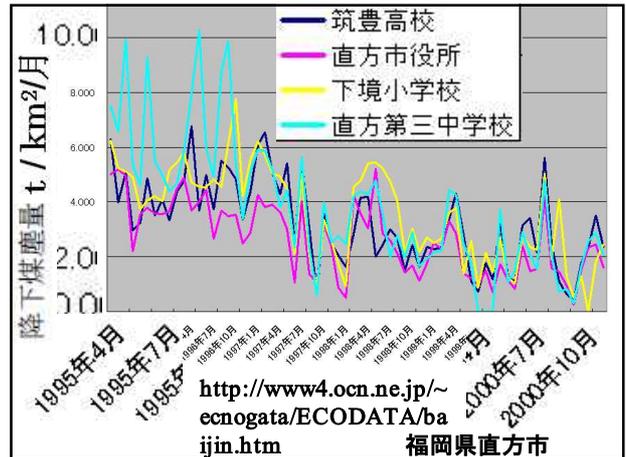
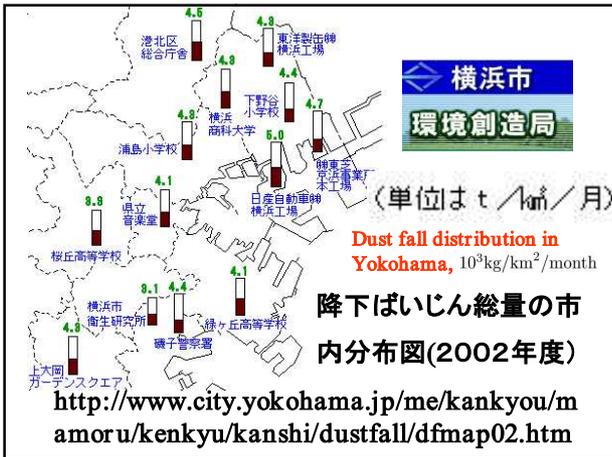
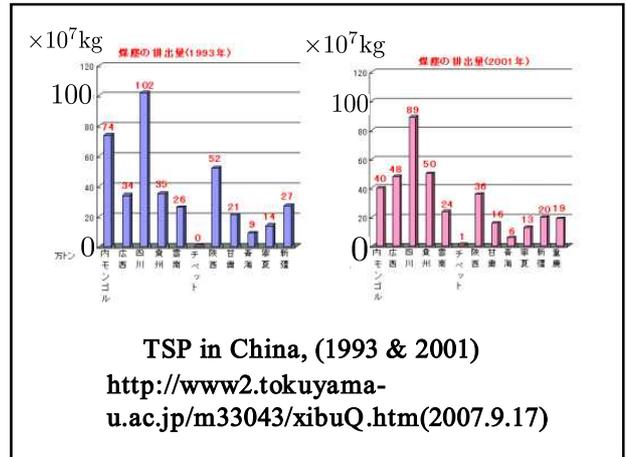
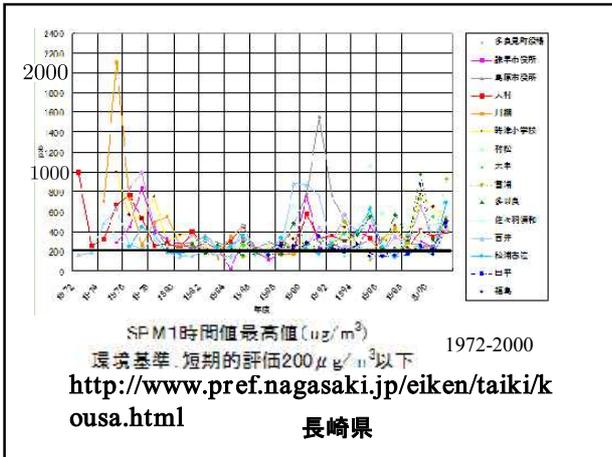
Current Environment

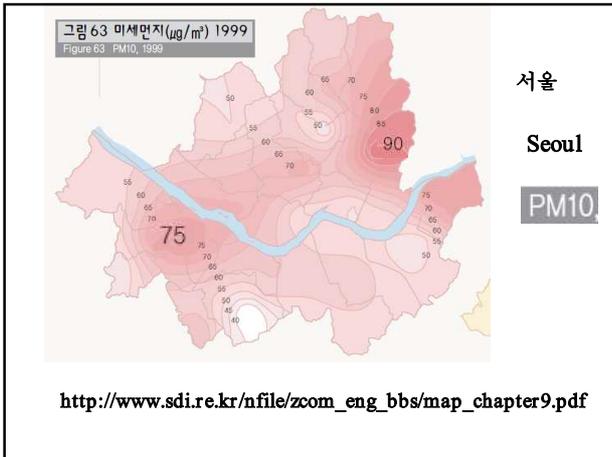


Sweden 86 Europa Stop acid rain stamp FDC

<http://cgi.ebay.com/Sweden-86-Europa-Stop-acid-rain-stamp->

FDC\_W0QQitemZ5610784940QQcmdZViewItem





Ex. Specification

白煙防止

外気温度5℃、湿度50%での白煙防止





Clear sky, Plovdiv, Bulgaria,  
August 16, 2007



Air pollution, Plovdiv, Bulgaria,  
August 16, 2007.



Istanbul, April, 1999



Sep., 2007  
Istanbul,  
Turkey

MINISTERO DEL  
TURISMO DELLA  
REPUBBLICA TURCA

Trafik Kontrol Merkezi  
Anlık Trafik bilgisine her zaman ve her yerden ulaşın...  
<http://tkm.ibb.gov.tr>



Shibuya  
Cleaning  
Center,  
Tokyo

渋谷清掃工場: 排  
気は200°Cに再加  
熱されて排出

[http://myrovf.fromc.jp/SimCity4/SIP\\_description.htm](http://myrovf.fromc.jp/SimCity4/SIP_description.htm) (2007.9.17)

## CBC Archives Acid Rain:

Dying lakes, dying crops



[http://archives.cbc.ca/IDD-1-75-584/science\\_technology/acid\\_rain/](http://archives.cbc.ca/IDD-1-75-584/science_technology/acid_rain/)

**The forests are feeling it**



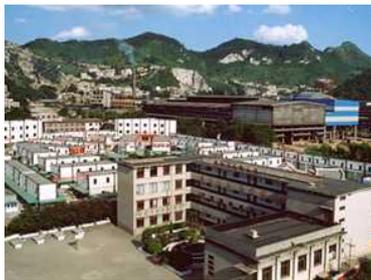
CBC Archives

Eastern Canada's trees are weakening under the strain of acid rain. (TV; runs 2:05)

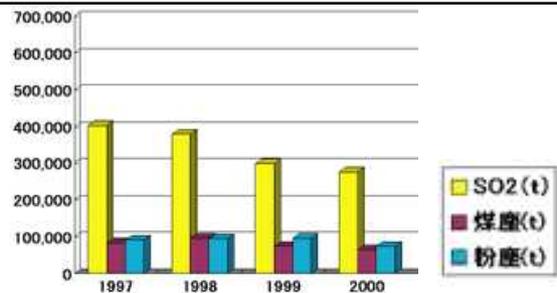
[http://archives.cbc.ca/IDD-1-75-584/science\\_technology/acid\\_rain/](http://archives.cbc.ca/IDD-1-75-584/science_technology/acid_rain/)



貴陽(Guiyang)製鉄工場 built in 1950's ( not revised ), Environmental Information & Communication Network, No.77, 2005 (大気汚染対策 前)  
<http://www.eic.or.jp/library/pickup/pu050804.html>



貴陽(Guiyang)製鉄工場 built in 1950's ( revised ), Environmental Information & Communication Network, No.77, 2005 (大気汚染対策 後)  
<http://www.eic.or.jp/library/pickup/pu050804.html>

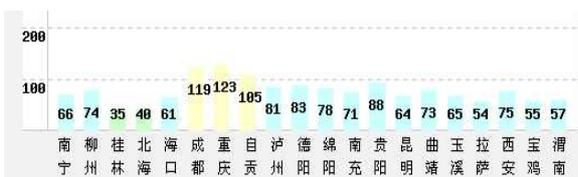


貴陽市全域の大気汚染物質排出量

<http://www.eic.or.jp/library/pickup/pu050804.html>

污染指数

2007-09-21



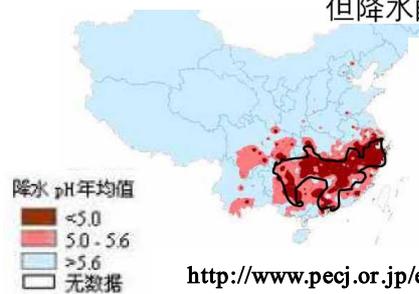
国家环境保护总局

[http://www.zhb.gov.cn/quality/air\\_s.php](http://www.zhb.gov.cn/quality/air_s.php)

中国酸雨面积基本保持稳定

但降水酸度增强

2005



[http://www.pecj.or.jp/english/jcap/pdf/jcap5thE/2-1-2\\_chen.pdf](http://www.pecj.or.jp/english/jcap/pdf/jcap5thE/2-1-2_chen.pdf)