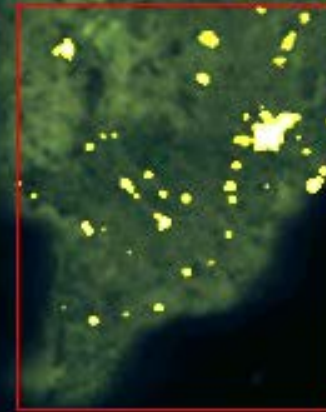




Urbanization in South Vietnam and Emissions –

Pham Bach Viet

HCMC Institute of Resources Geography - VAST
Hochiminh City, Vietnam



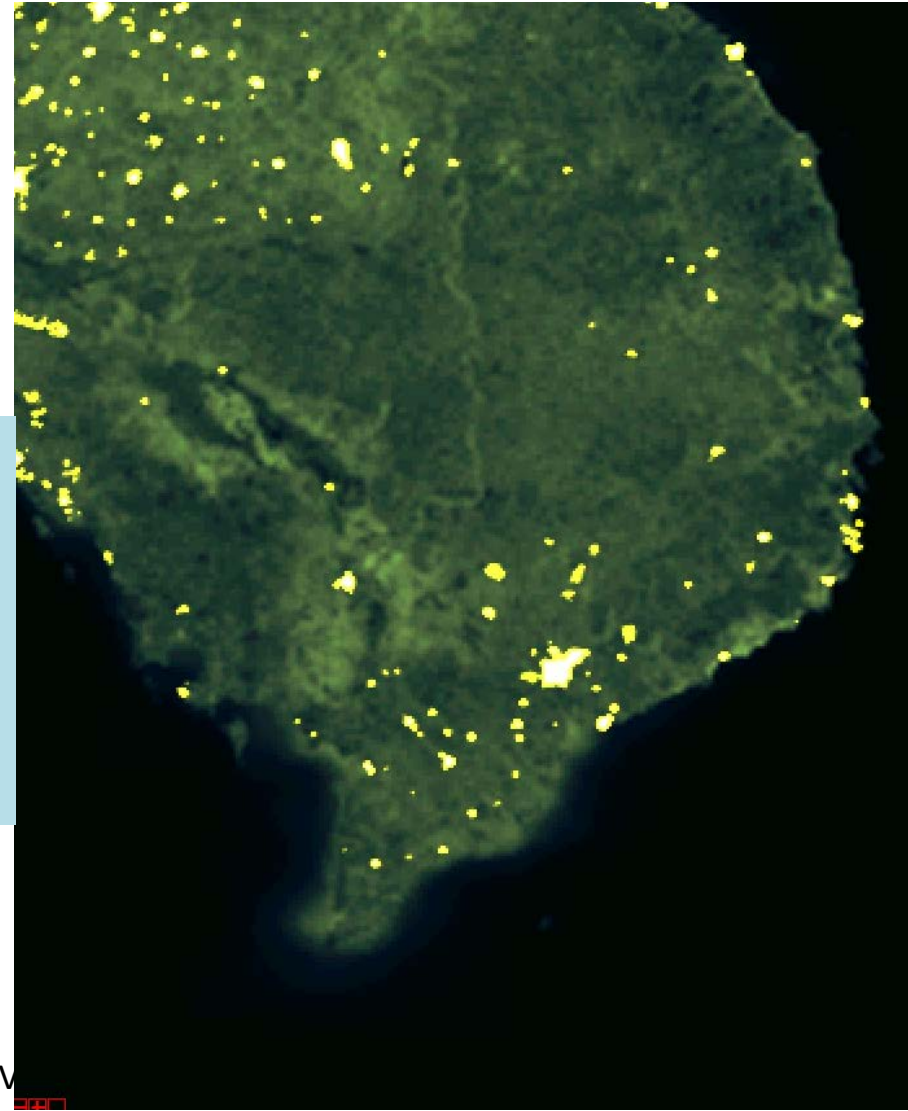
Contents

- 1. Introduction
- 2. Urbanization in South Vietnam and Hochiminh City
- 3. Emission related to Urbanization

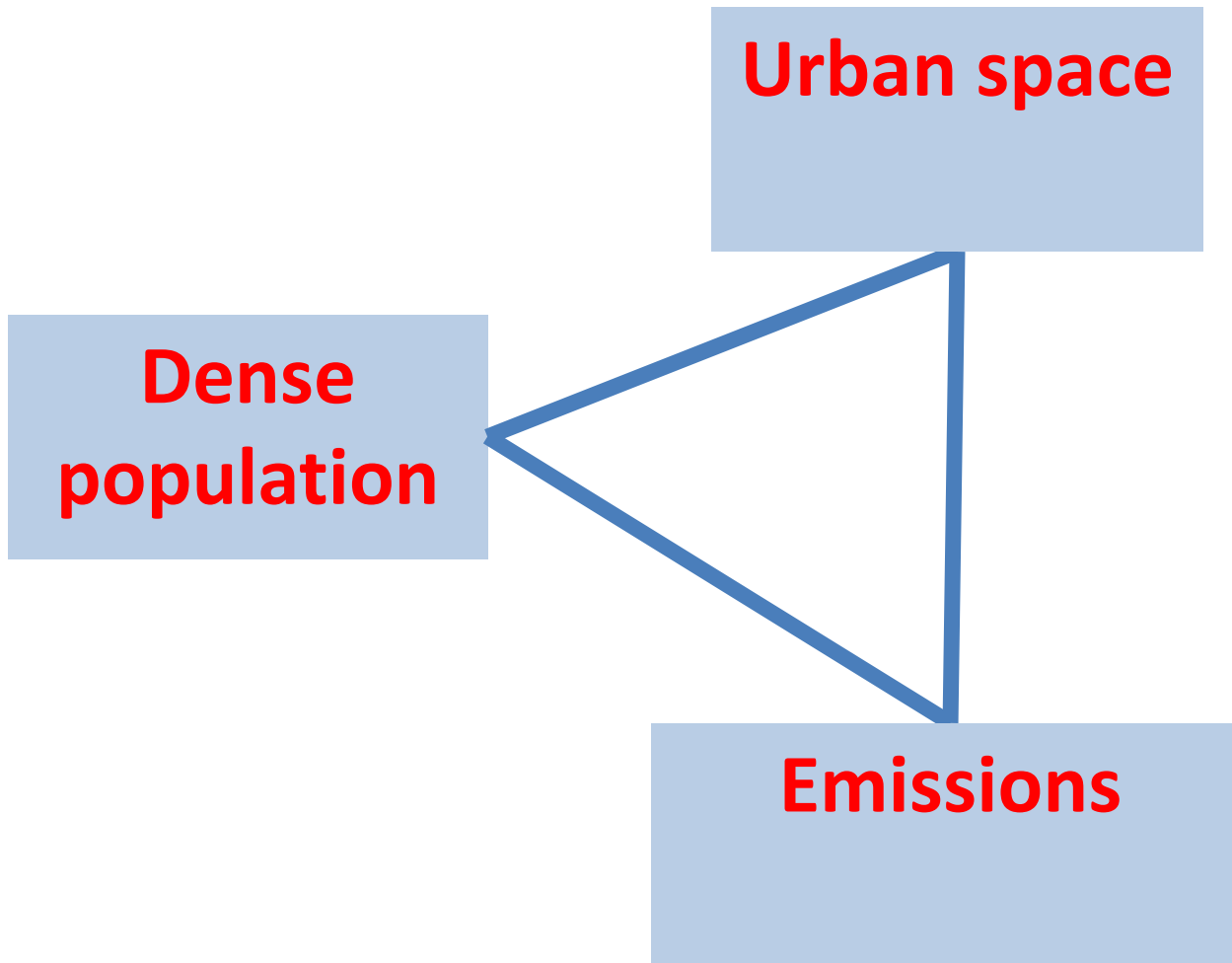
1. INTRODUCTION

- **Urbanization in South Vietnam began in late 1960s, mostly in HCMC (Saigon)**

- **Almost no change until early 1990s since there have been new industry zone established in HCMC, and there were new policies on economic**



2. URBANIZATION IN SOUTH VIETNAM - & IN HOCHIMINH CITY



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HCMC



Can Tho

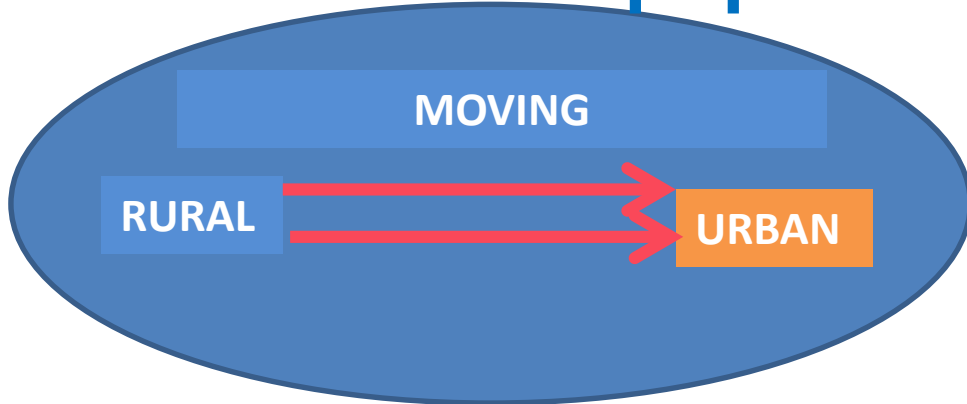


Bien Hoa

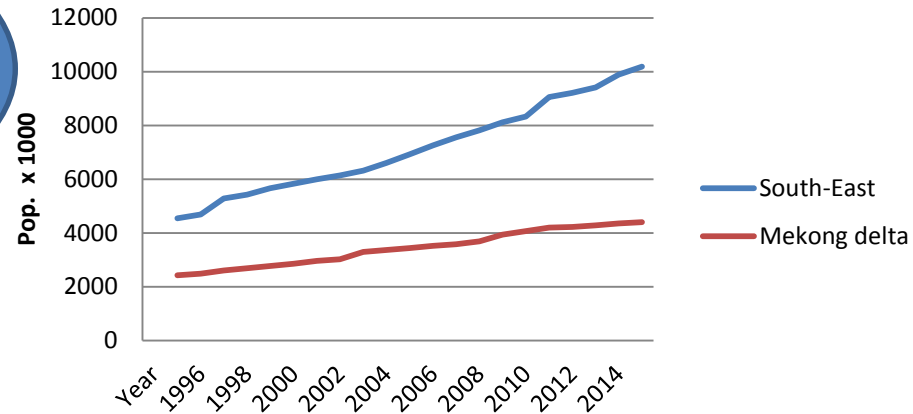


**Thu Dau Mot –
Binh Duong**

Fast increase population



Urban population in South-East and Mekong delta 1995-2015



Urban pop. / Total (2015) – Census 2016 (mil.)

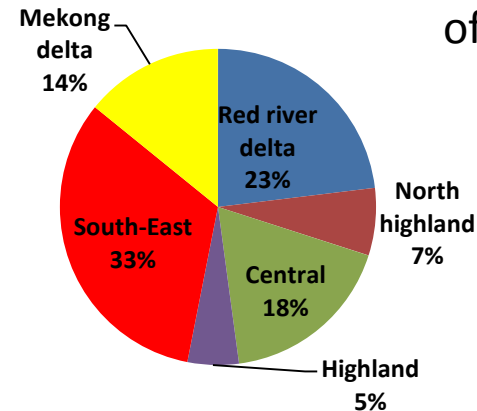
| | |
|----------------|----------|
| HCMC: | 6.6/ 8.1 |
| Binh Duong: | 1.4/ 1.9 |
| Dong Nai: | 1.0/ 2.9 |
| Baria-Vungtau: | 0.5/ 1.0 |
| Can Tho: | 0.8/ 1.2 |

Total pop.

| | |
|--------------------|------------|
| South-East region: | 10.1/ 16.1 |
| Mekong delta: | 4.4/ 17.5 |

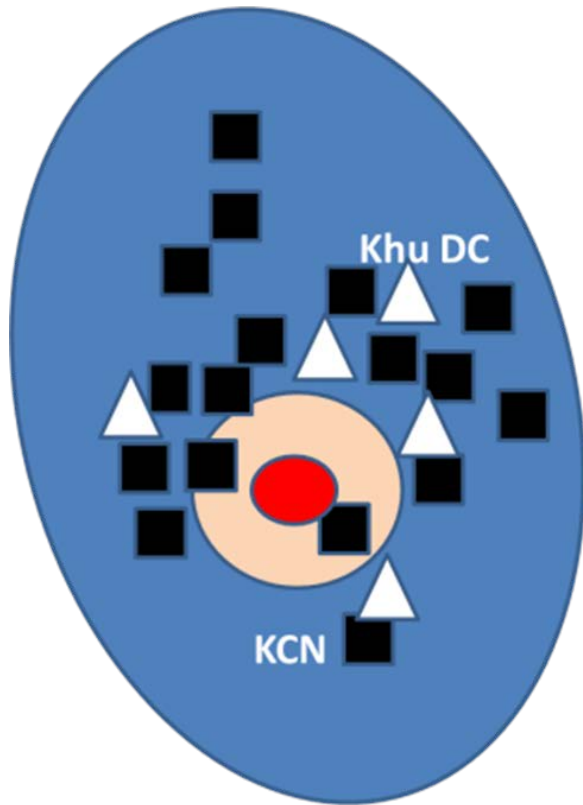
HCMC takes
45.8% for SE
and MD

Urban pop. 2015 whole VN ~ 31 mil.



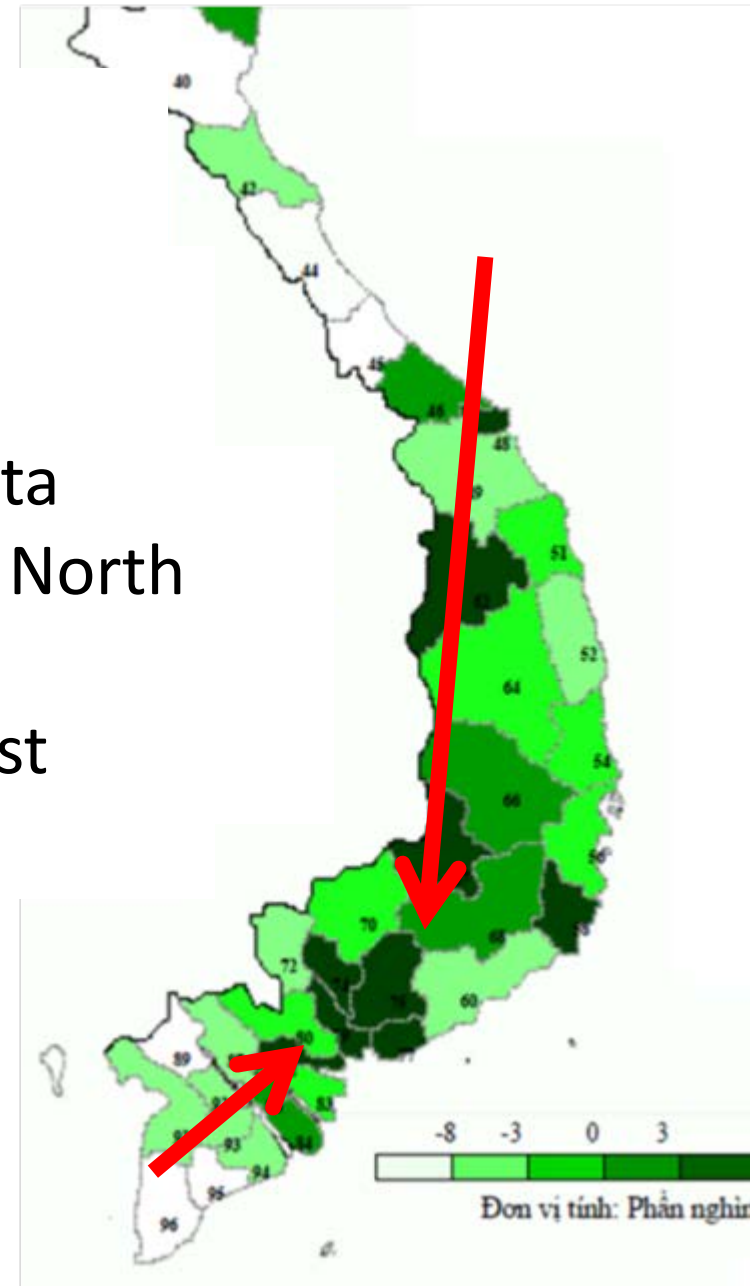
SE + MD = 47%
of country

Migration:



Migration:

- 90% from Mekong delta
- > 60% from North and Central
- To South East region



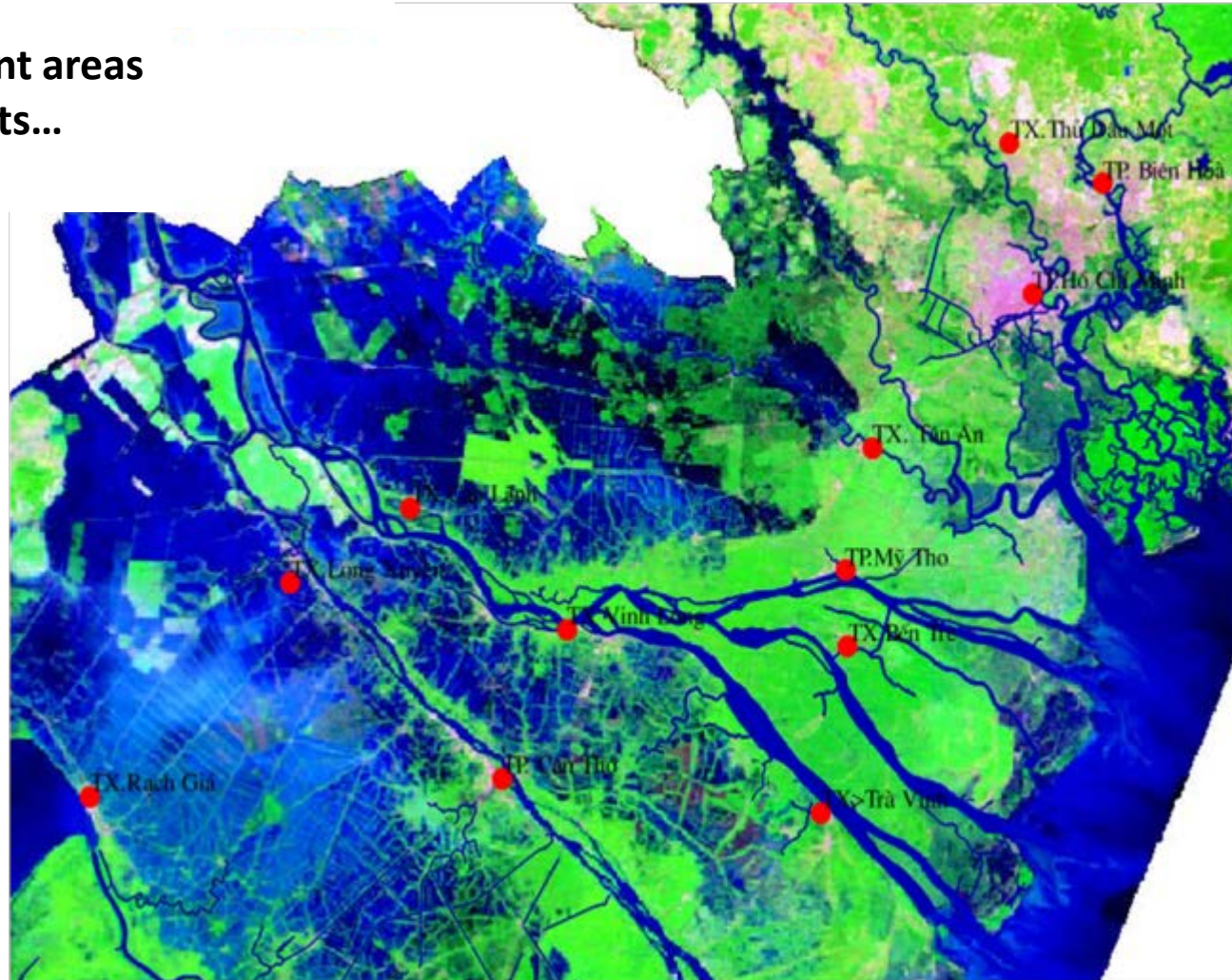
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**New residents surrounding industry plants that were in 1970-1980
in the old inner city**

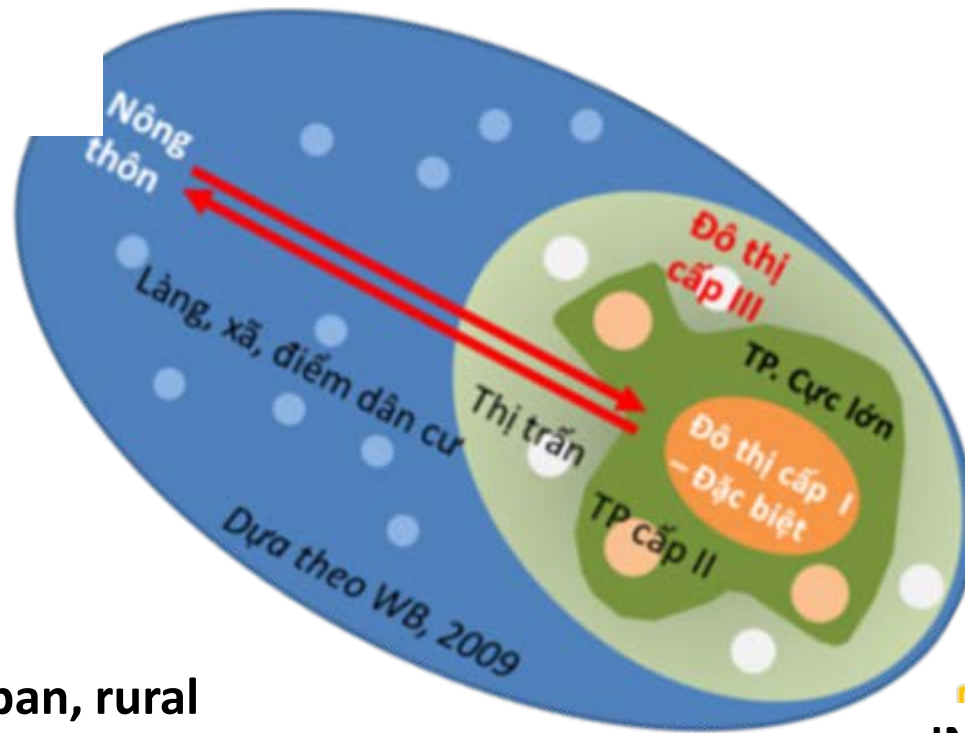
Urban space

Natural swamps -> resident areas
Cultivated land -> residents...



Urban space

Expanse in horizon
plan
Less compact
Take more areas
Less open space

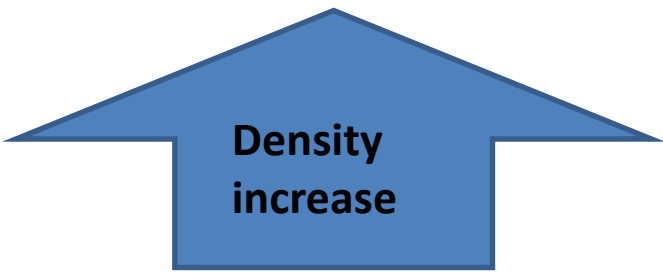


Fringe, sub-urban, rural
areas

INNER City
Construction Density

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Inner city, central, downtown



Density
increase



Fringe areas



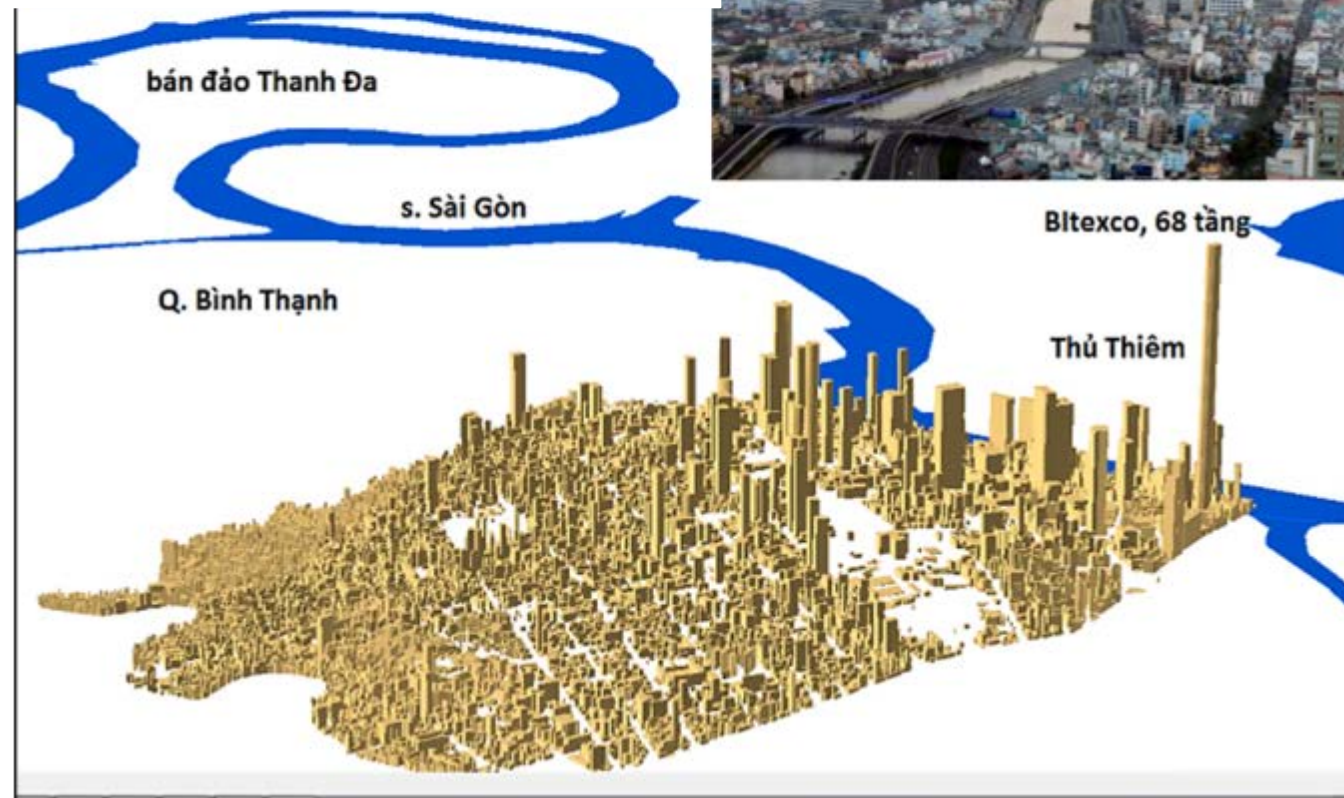
Urban space

95% houses < 5 floors

4.5% > 5 floors

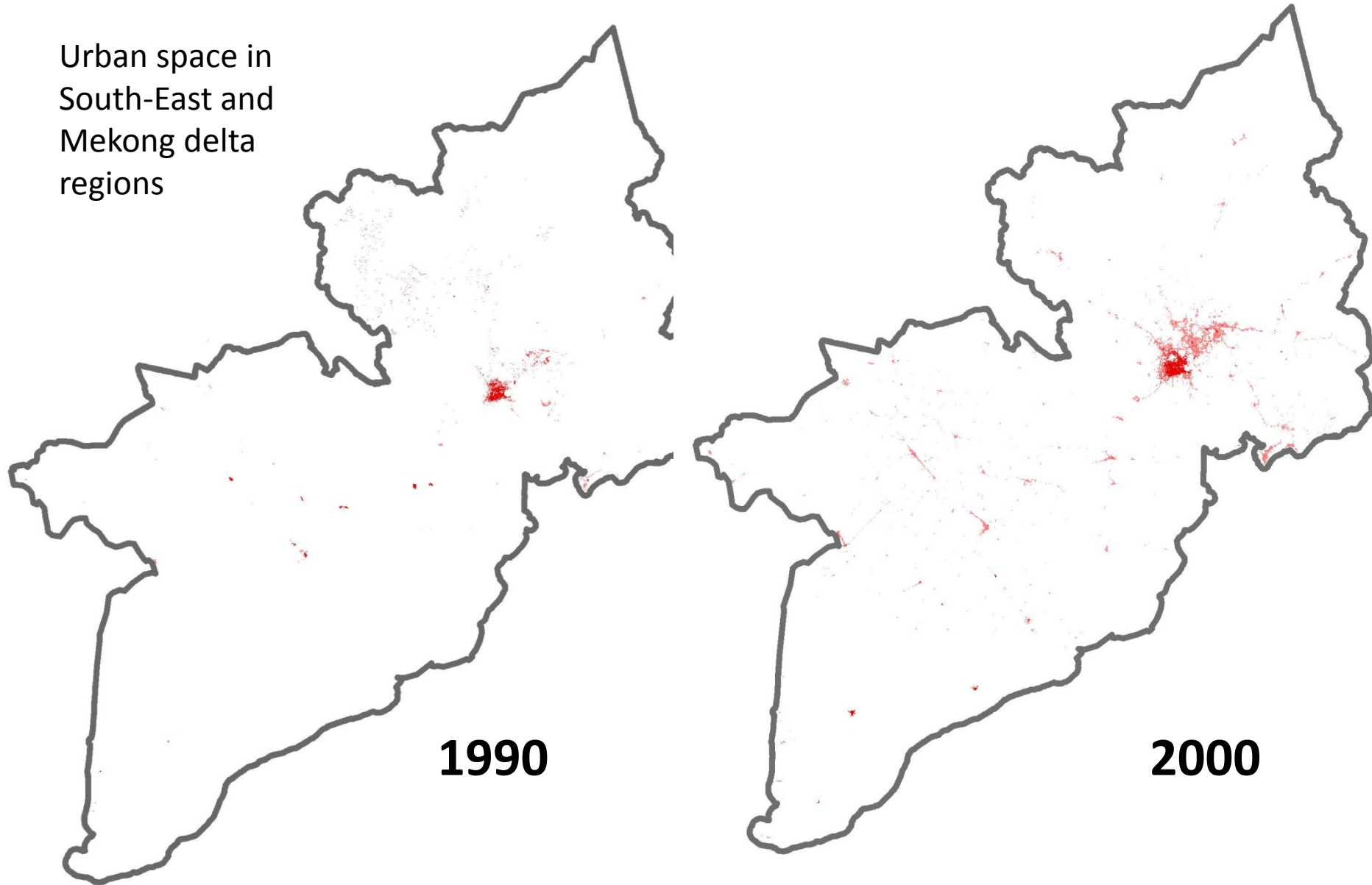
1-2% > 10 floors

Low
compactness
Less open
space/ green
space



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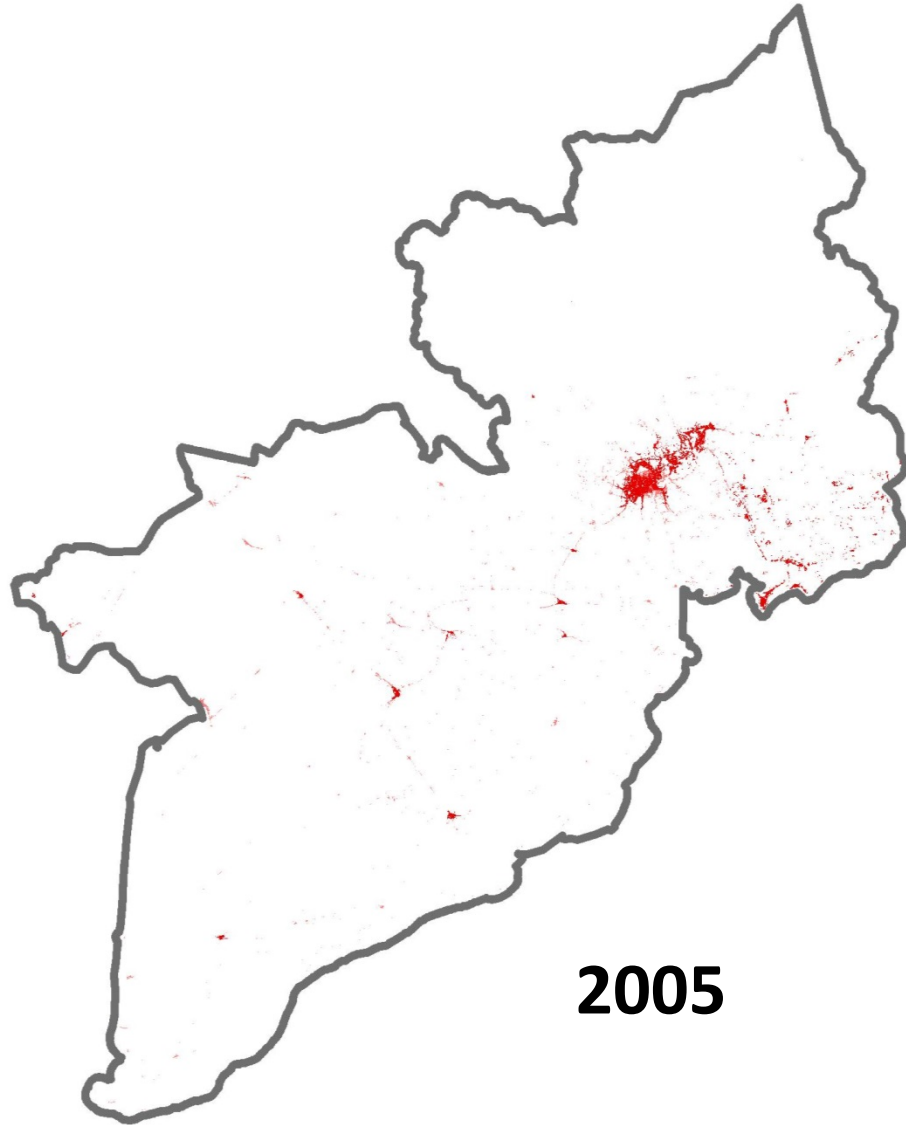
Urban space in
South-East and
Mekong delta
regions



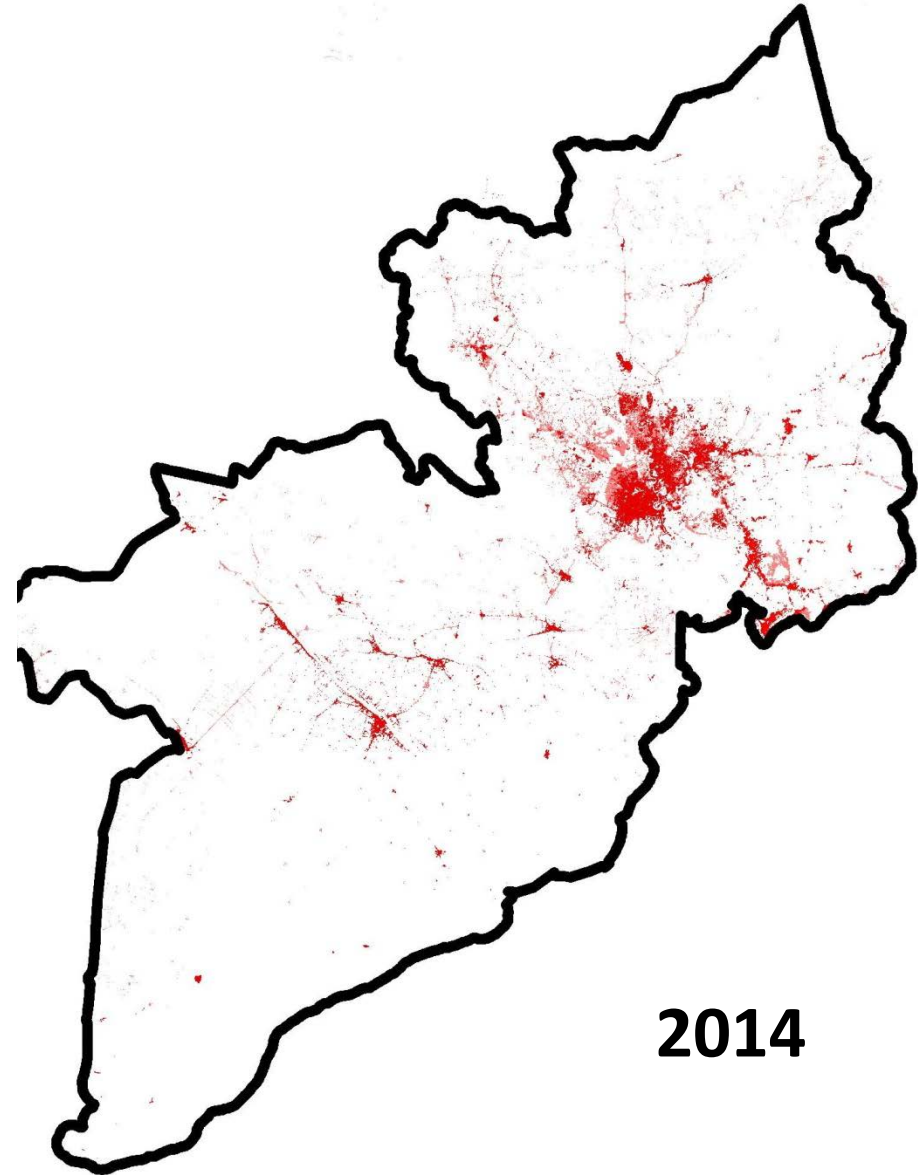
1990

2000

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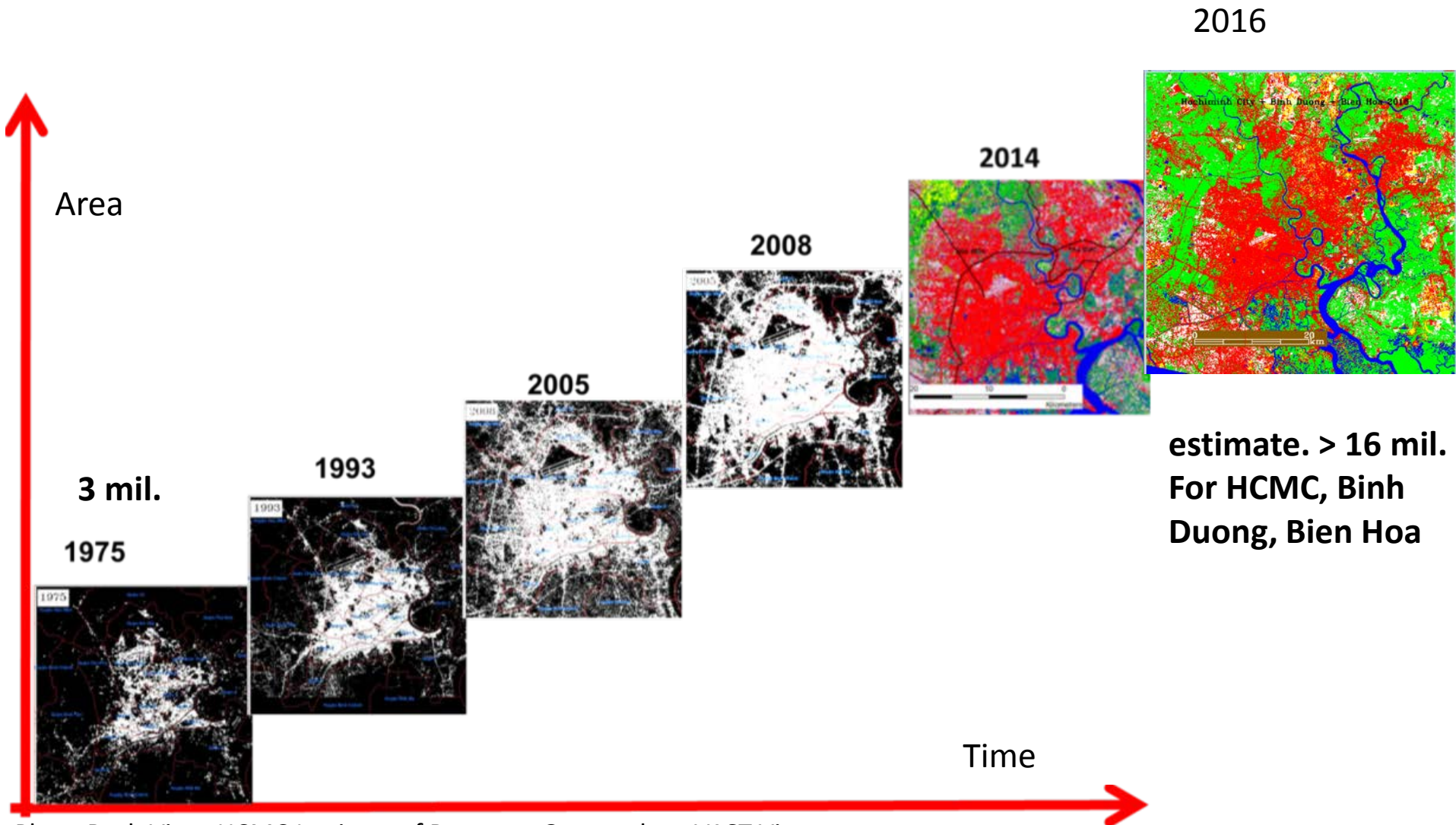


2005

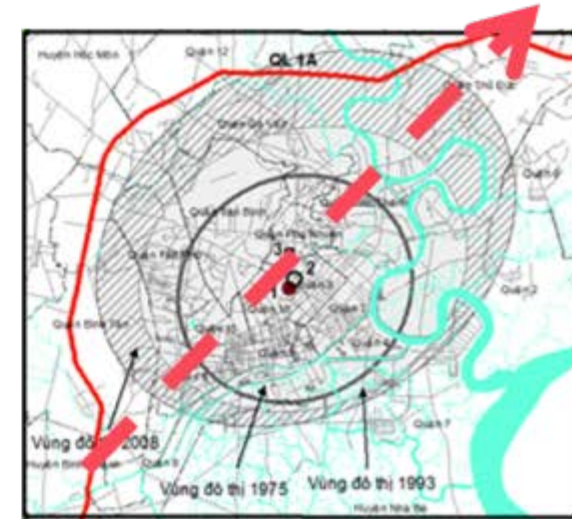
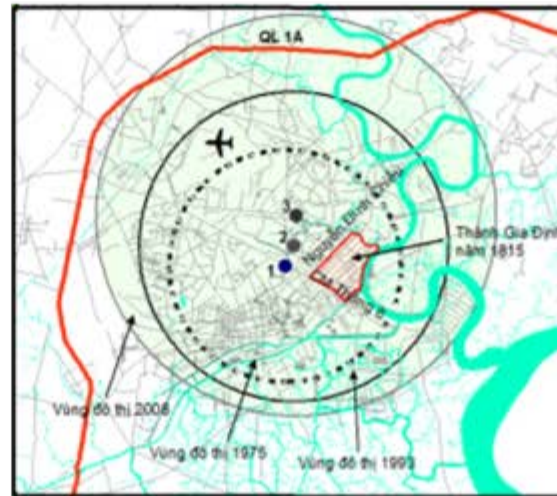


2014

Urbanization in HCMC - Megacity



Urbanization in HCM region – Megacity



Không gian đô thị TP. Hồ Chí Minh 1975-2014

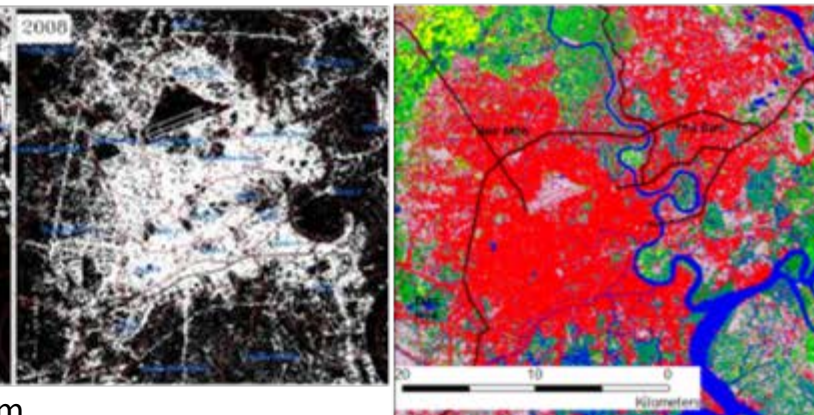
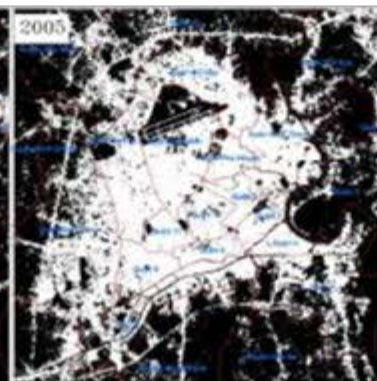
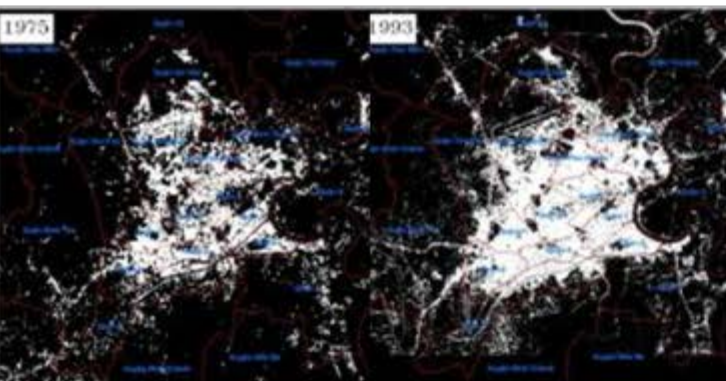
1975

1993

2005

2008

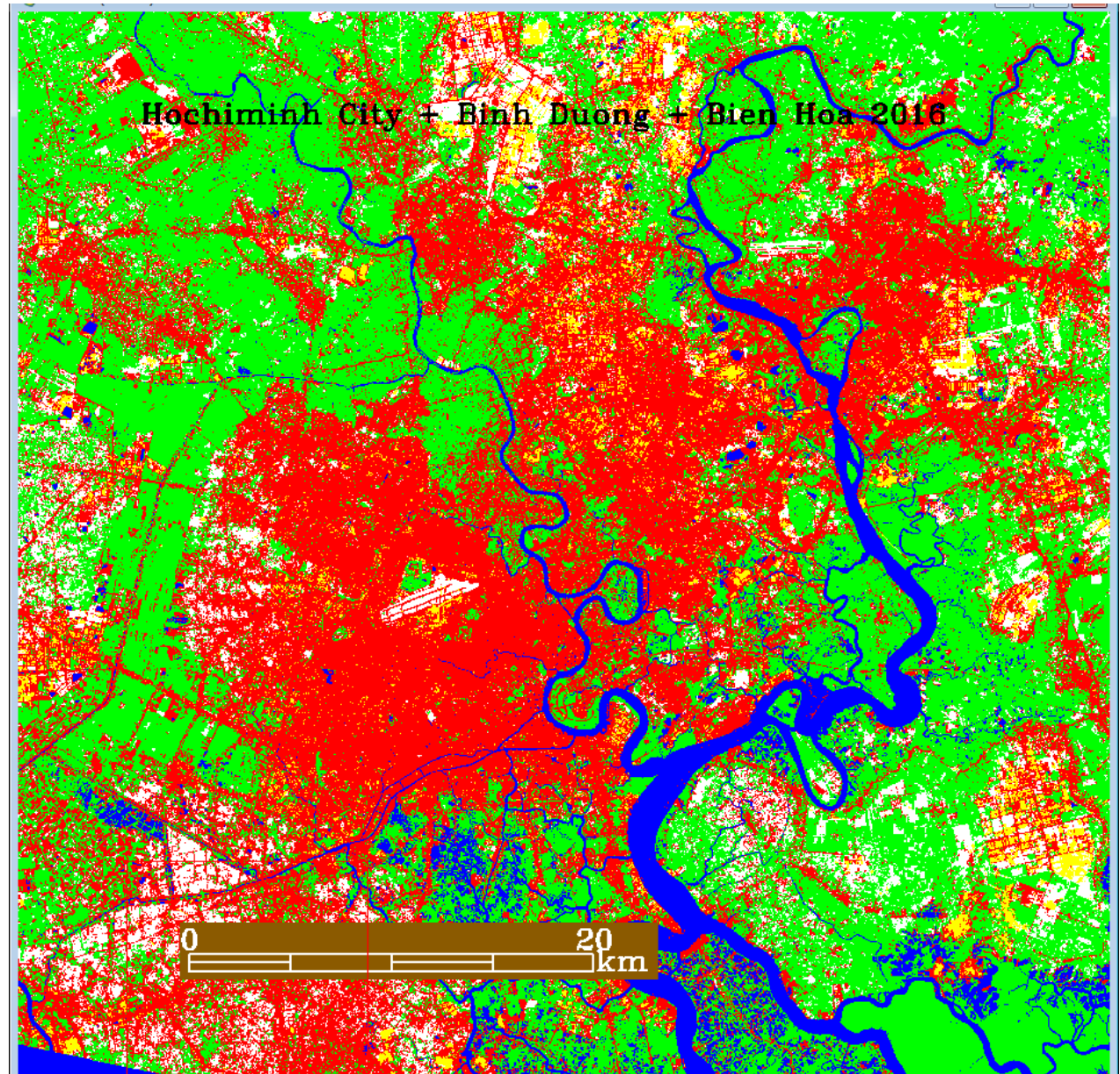
2014



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**+ Urban space in
HCM, Binh
Duong, Bien Hoa
in early 2016
(extracted from
L8)**

**+ Pop. at the
end 2015: 8,2
mil. (official
census)**



Urbanization in HCMC region - Megacity

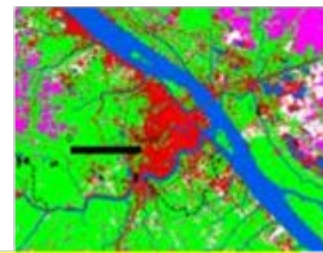
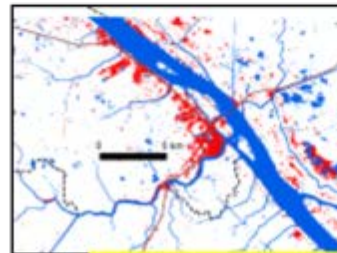
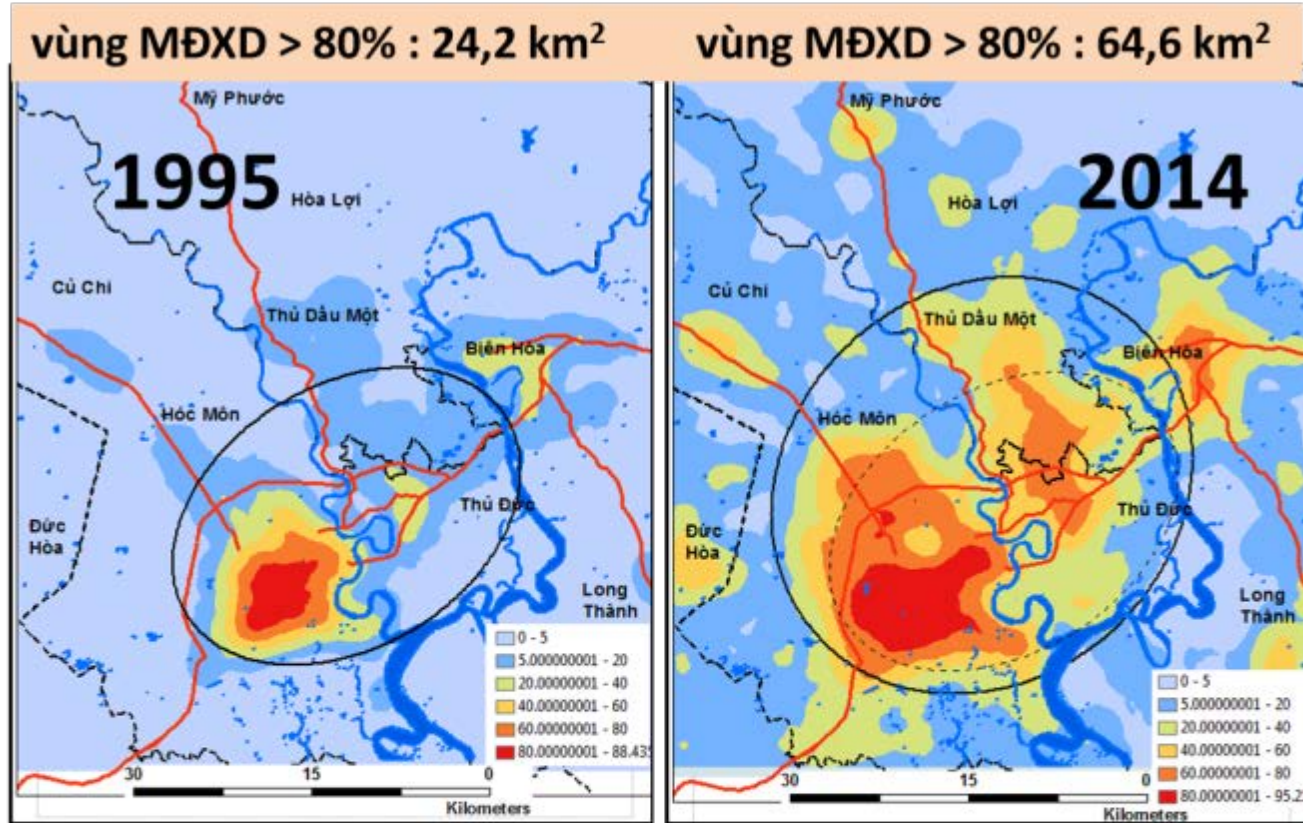
Increased > 2.6 times
on area within 20 yrs

Axis

North-Est South West
37km

North West – South Est
32 km

Expansion of area of
high construction
density



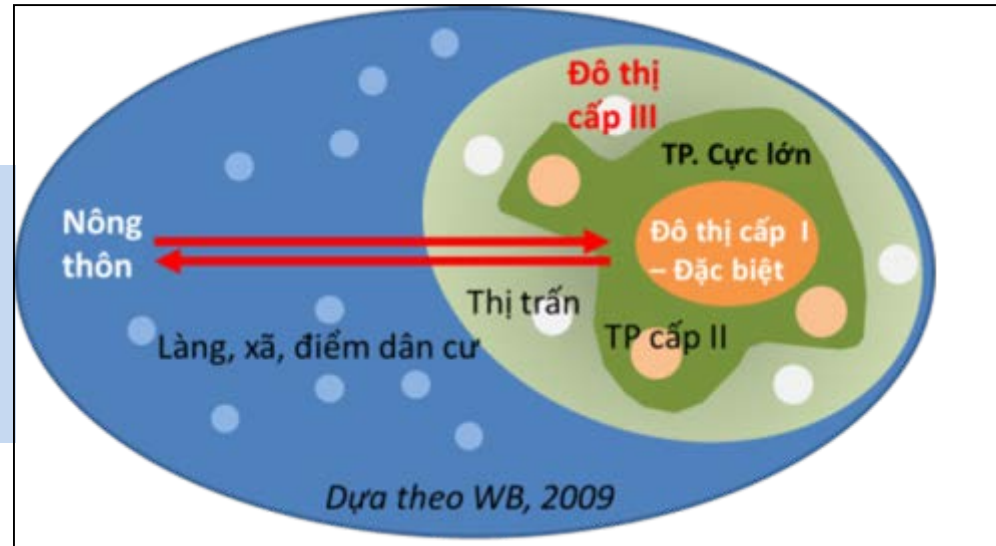
CẦN THƠ cùng thời gian

Urban space

Transportation

People moving in and out everyday
for incomes

Increase vehicles



Private motobikes, cars are main means for people

Urban space

Transportation



**Dense, crowded, traffic jam,
congestion everyday**

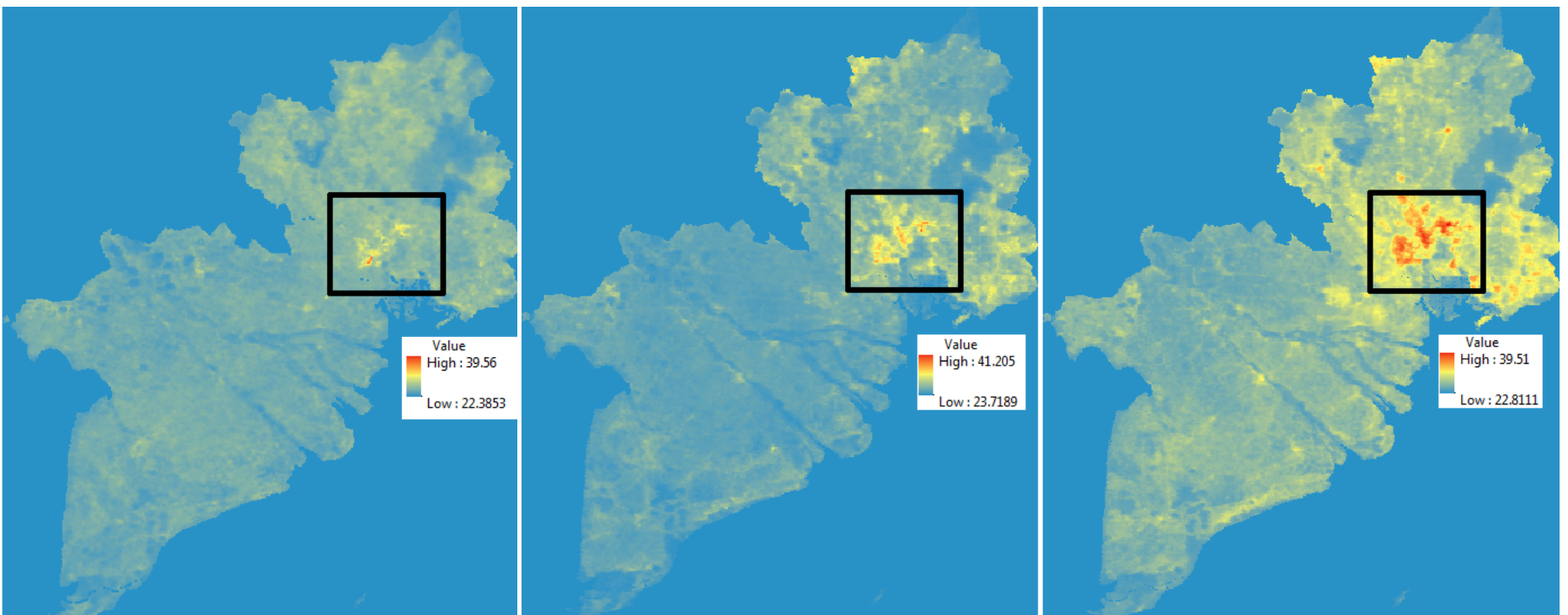


3. EMISSION

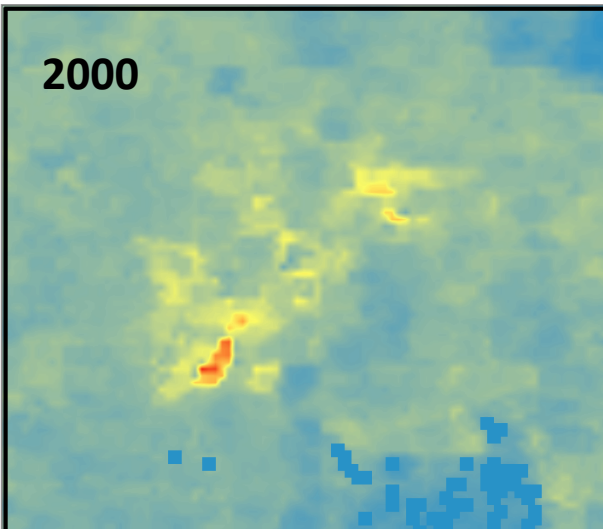
- **Heat:** due to Increase impervious surface: paved roads, streets (dark materials,) decrease open space (grass, wetland, rivers..)
- From vehicles : cars, vans, trucks, motobikes... (burning gasolines, thermal & gas emissions (CO, CO2...))
- From energy consumed in houses, buildings, industry plants
- From burning domestic waste

EMISSIONS

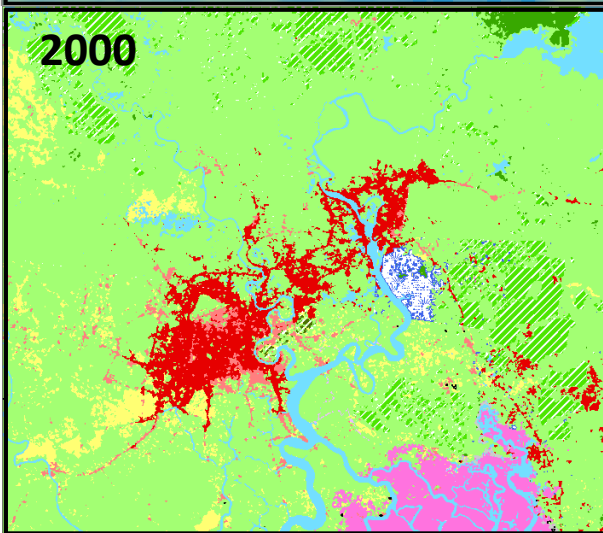
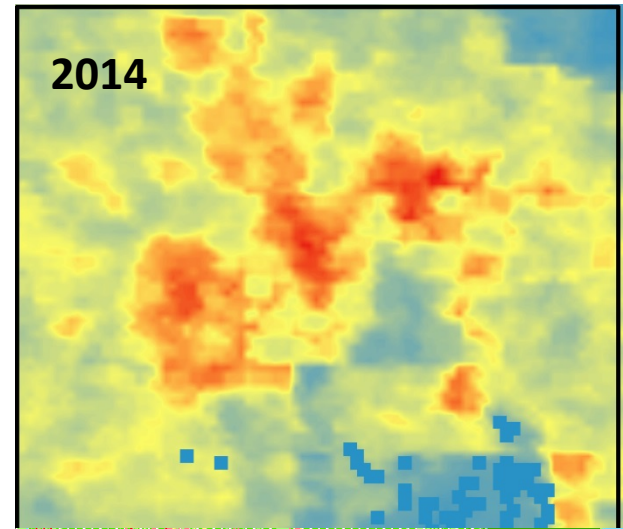
LST – Land Surface Temperature 2000 – 2010 – 2014



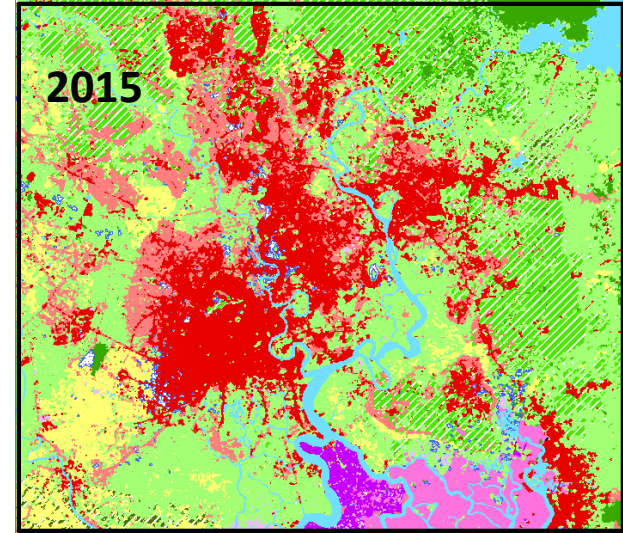
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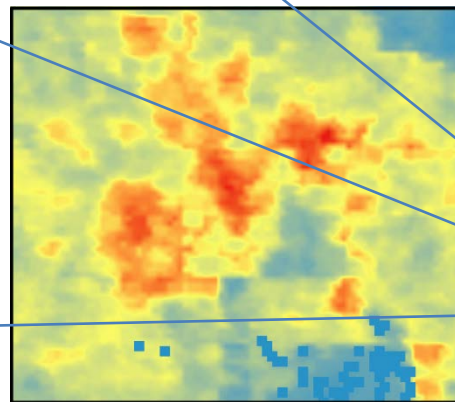
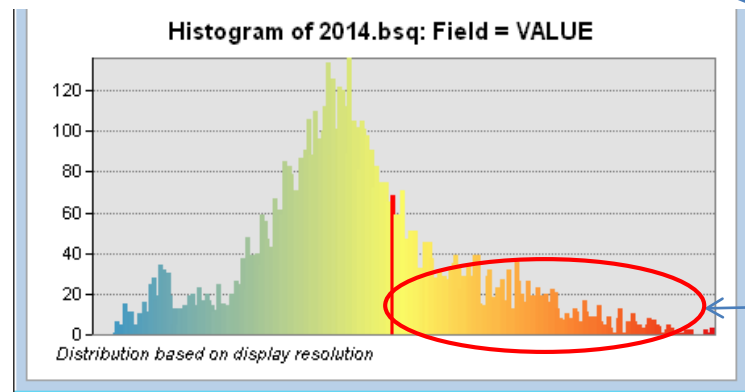
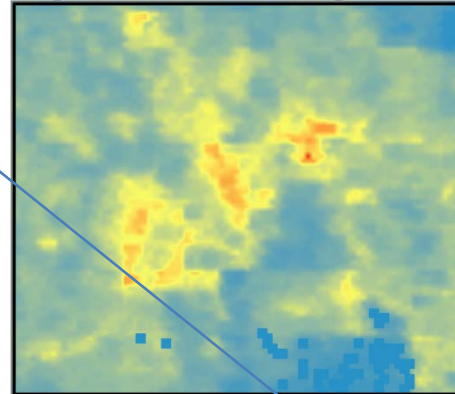
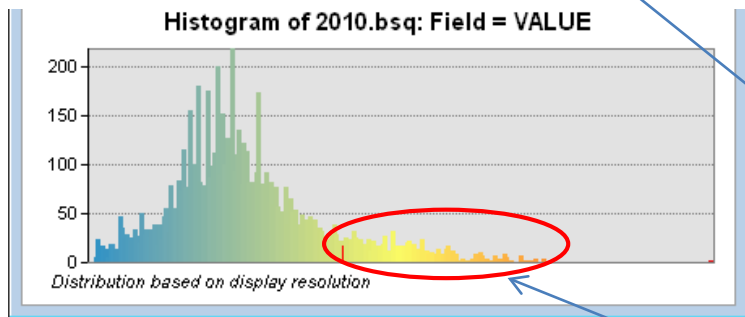
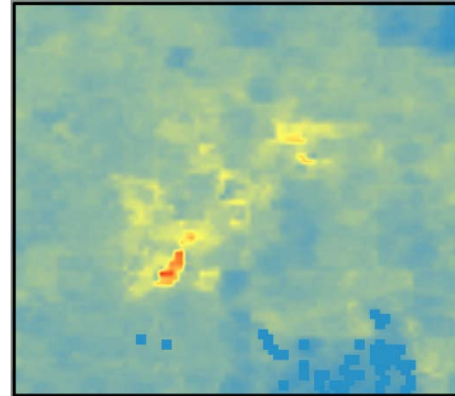
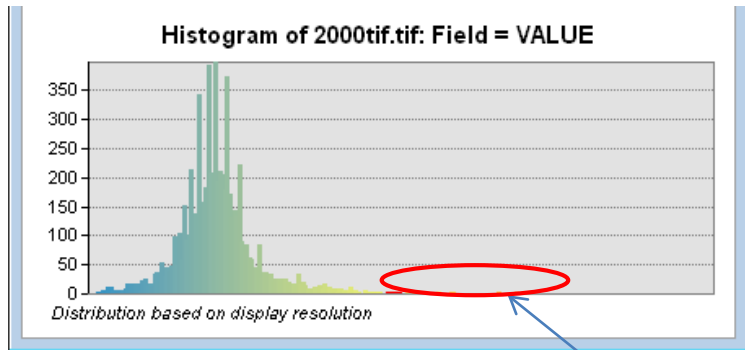
LST



Urban area



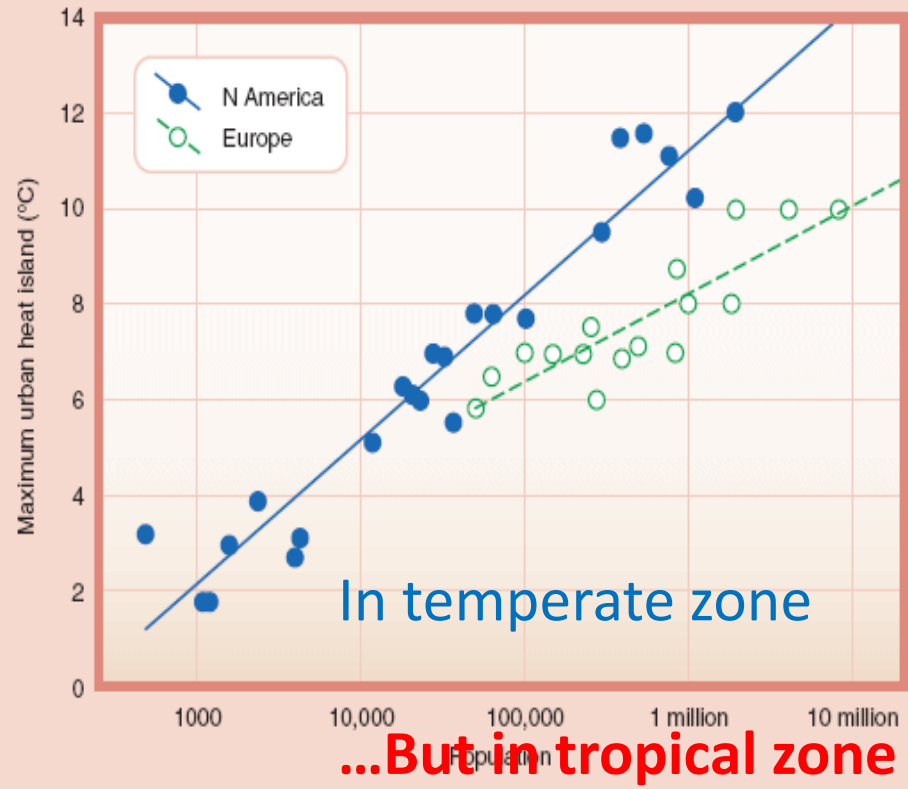
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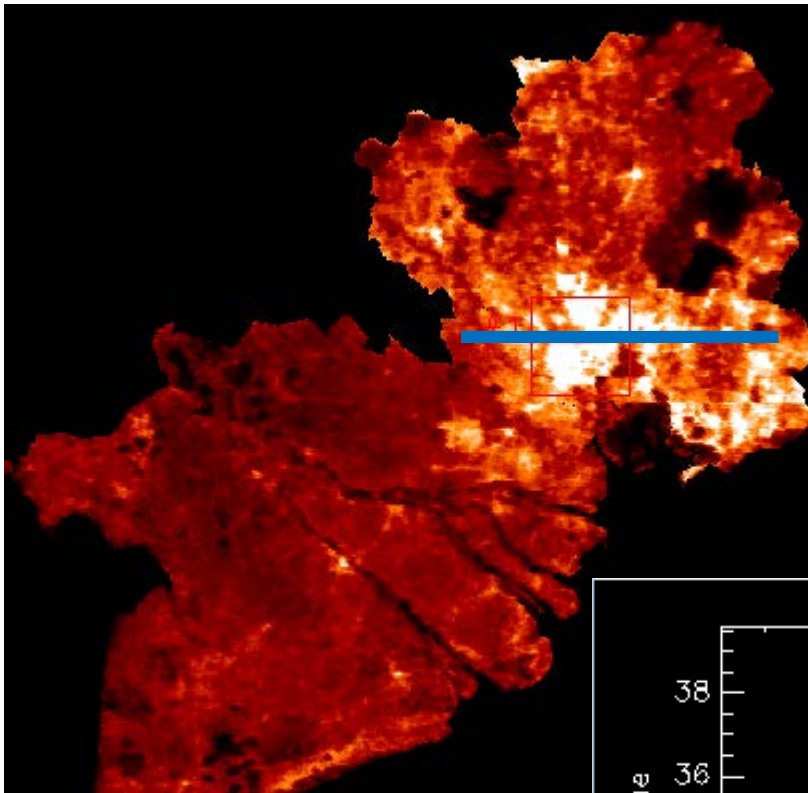


Area of surface with greater than 30°C expanding For HCMC – Binh Duong – Bien Hoa region

30°C

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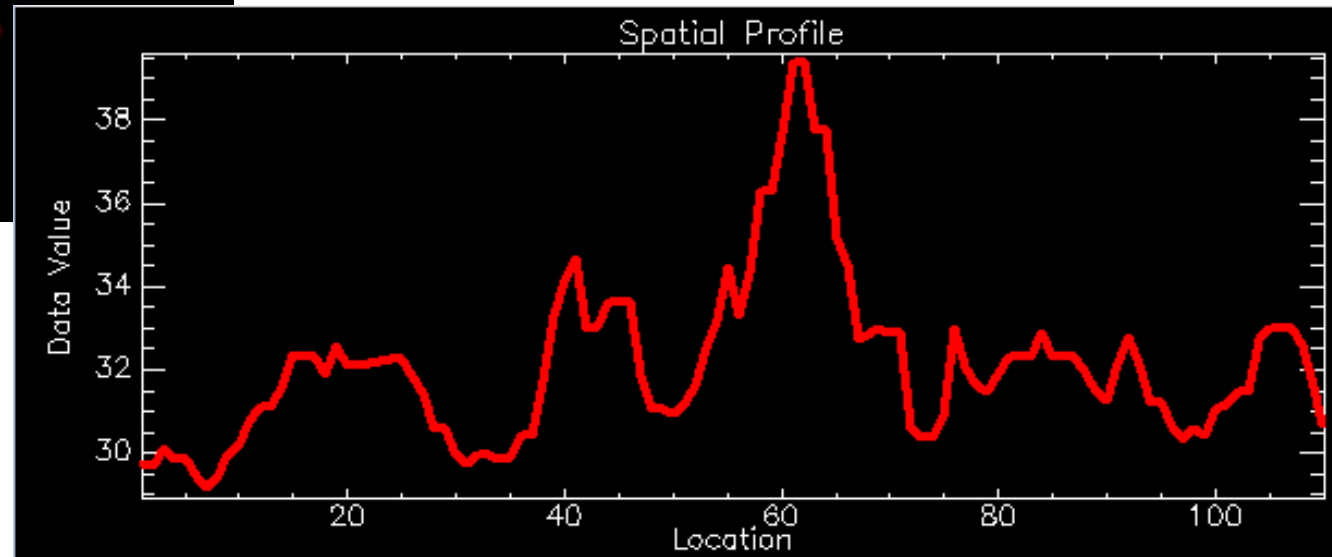




Average LST in 2014
Max: 39.5°C

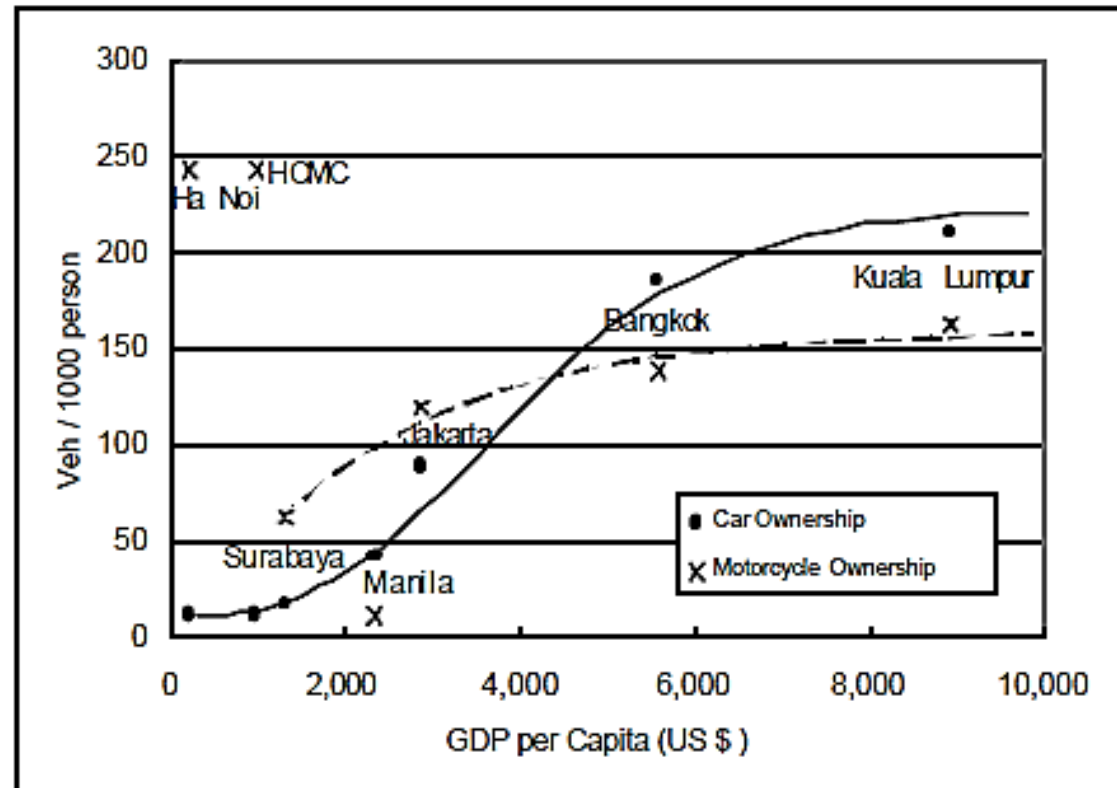
Sub-Urban

Urban Core



Emission relate to transportation in HCMC

**~ 250 veh.
per 1,000
pop. In
2009**



Source: JBIC research paper no. 4, 1999
(Urban public transportation in Vietnam)

But now

**Nearly 1
 motobike for
 one person**

**Suppose:
 50% get out
 everyday
 Consume
 1/2 litre of
 gasoline
 ~ 250,000
 littres burn
 Heat
 emission ?**

Cars and Motobikes, official recorded in HCMC 2011 - 2015

SỐ LIỆU TĂNG TRƯỞNG PHƯƠNG TIỆN GIAI ĐOẠN 2011 - 2015



**At the
 present
 8-9 mil.
 Motobikes
 0.5 mil. Cars**

+ ...



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250,000 litre
+ 200,000 lit
due to traffic
jam 1
hour/day of
40,000 vans,
trucks

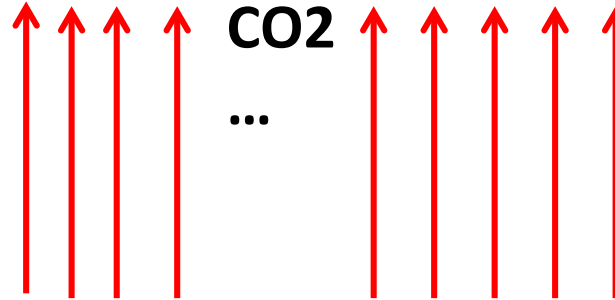
⇒ ~ 0.5 mil
litre
gasolines
burned
with only ~
30% efficient

Heat

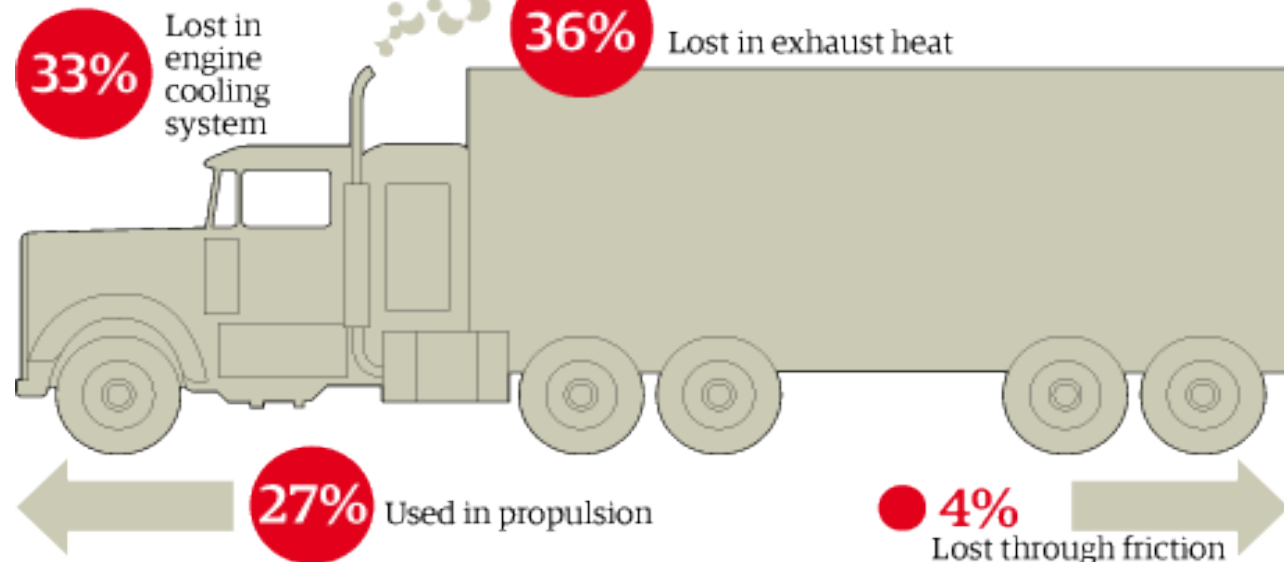
CO

CO2

...

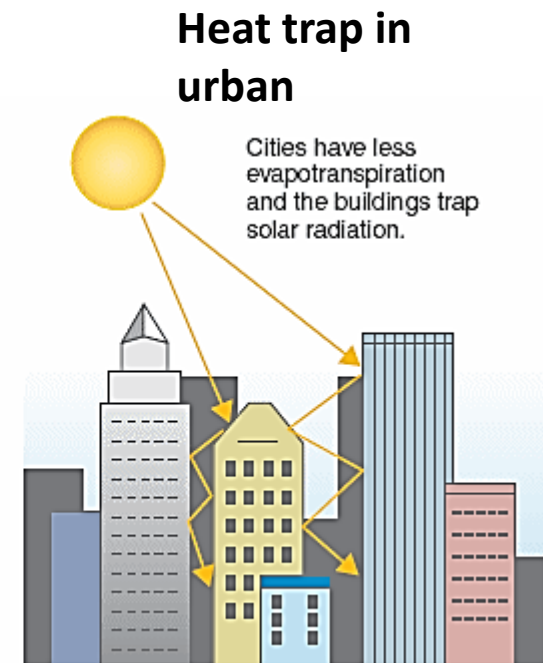
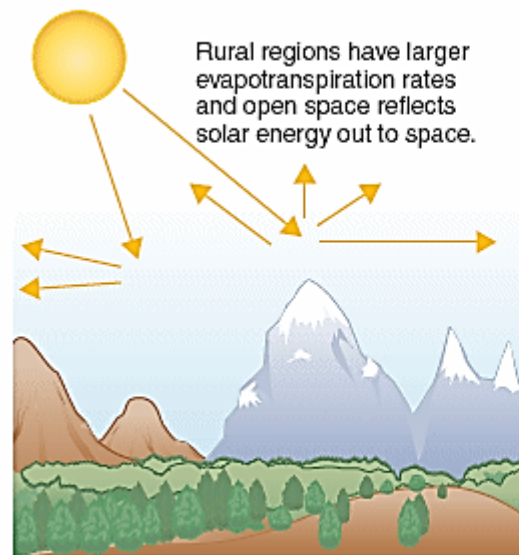


Where the energy is lost



Thermal emission

- Energy consumption for cooling systems in buildings, private houses
- Heat inside buildings move outside environment
- Increasing Heat
- And
- others not discuss here



Others

- CO, CO₂, ... emitted from transportation
- from waste burned

- Not yet quantified

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Cảm ơn
Thank you

Email:
phambachviet@gmail.com