

# Benefit Analysis for the HKO's Location-specific Lightning Alert Service

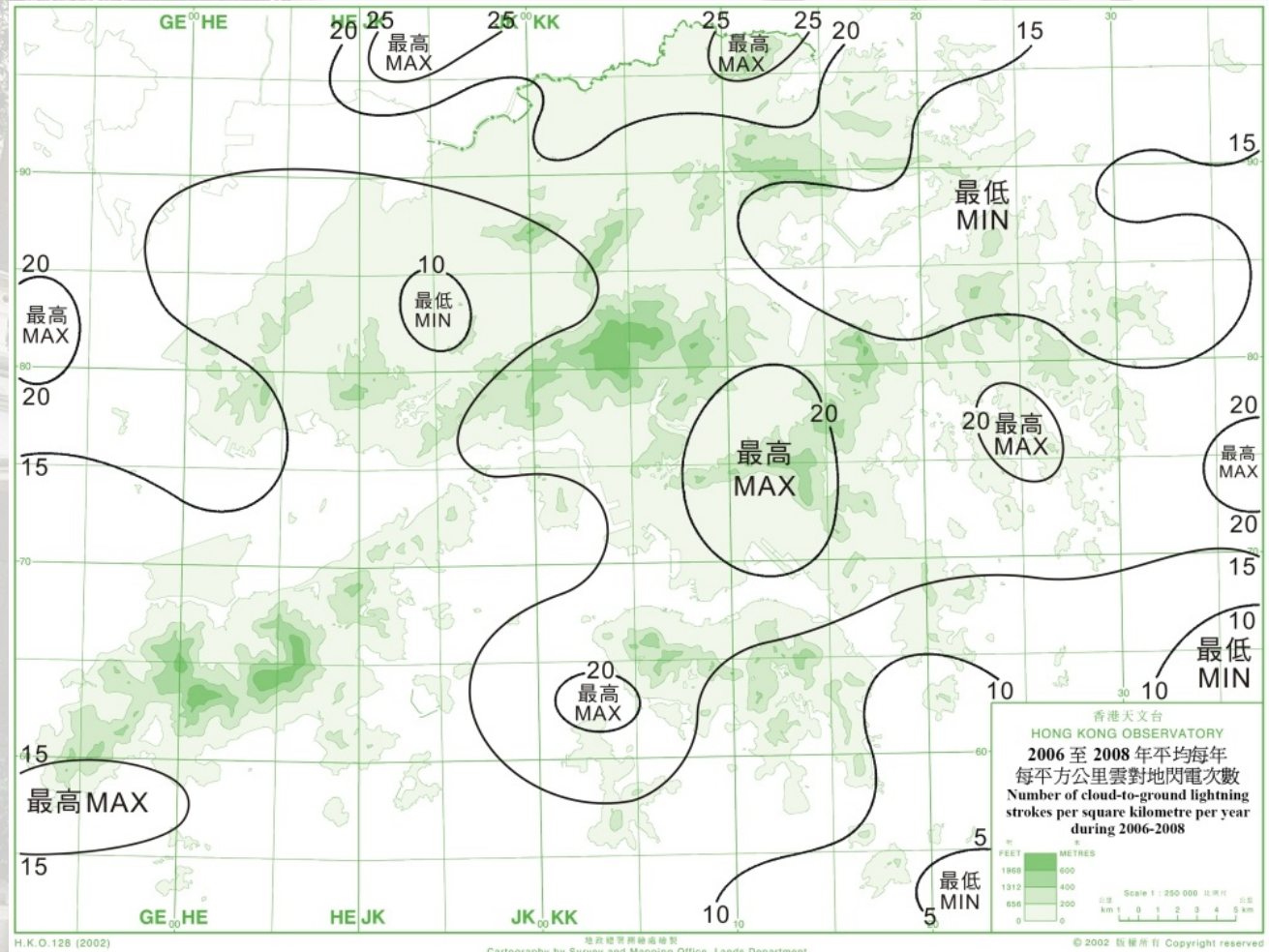
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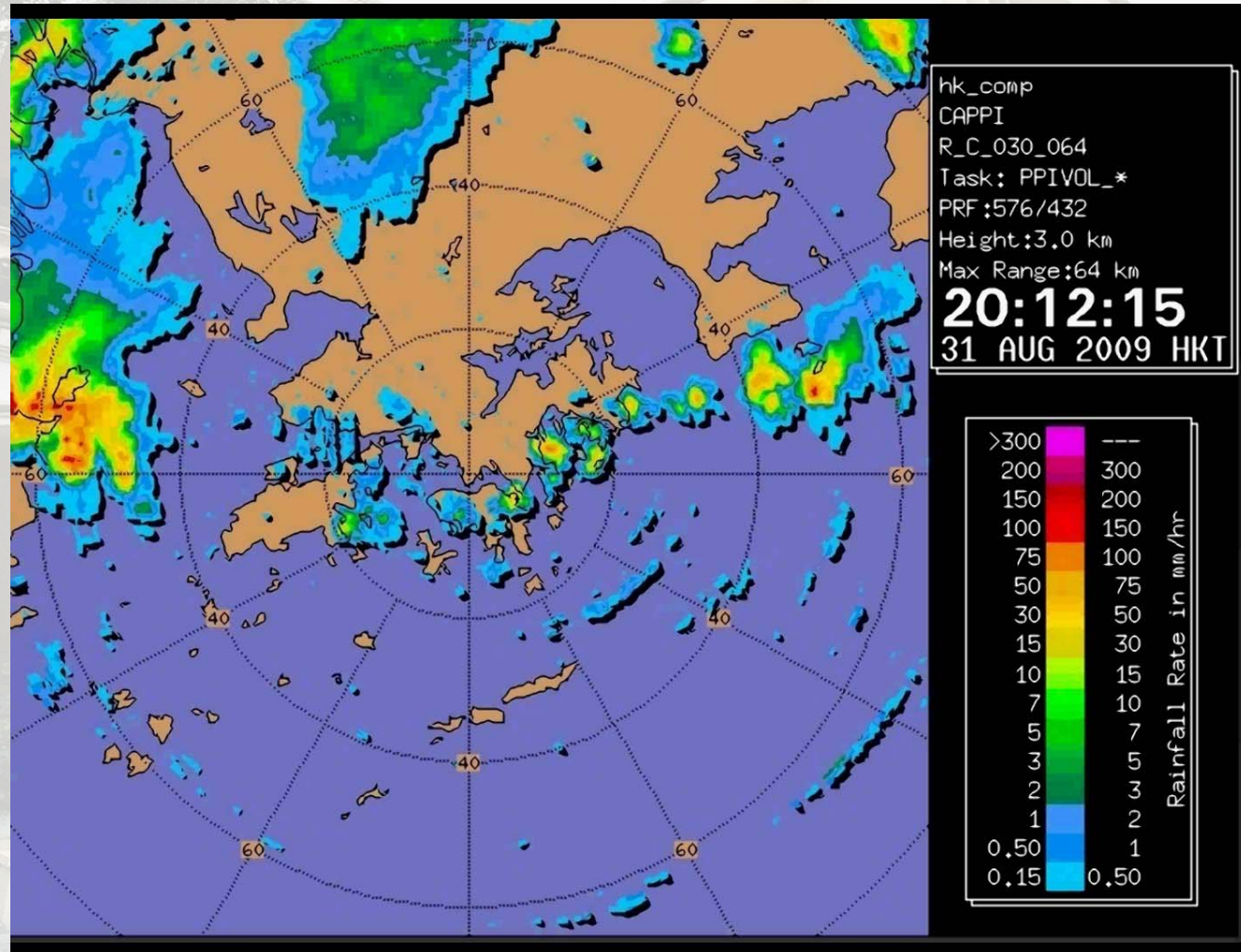
# Over 50,000 lightning strokes per year in HK

- Number of cloud-to-ground lightning strokes per square kilometre per year during 2006 to 2008
- Randomly distributed within HK



# Most thunderstorms are *localized, fast-moving and affect only parts of the territory*

- Radar sequence on 31 August 2009



# People most affected by lightning

- Outdoor workers (construction sites, maintenance of power cables, etc.)
- Outdoor swimming pool operators and swimmers
- Hikers, campers, scouts
- Airport ground personnel, boarding/landing passengers
- Other people engaging in outdoor activities



# HKO's lightning detection network

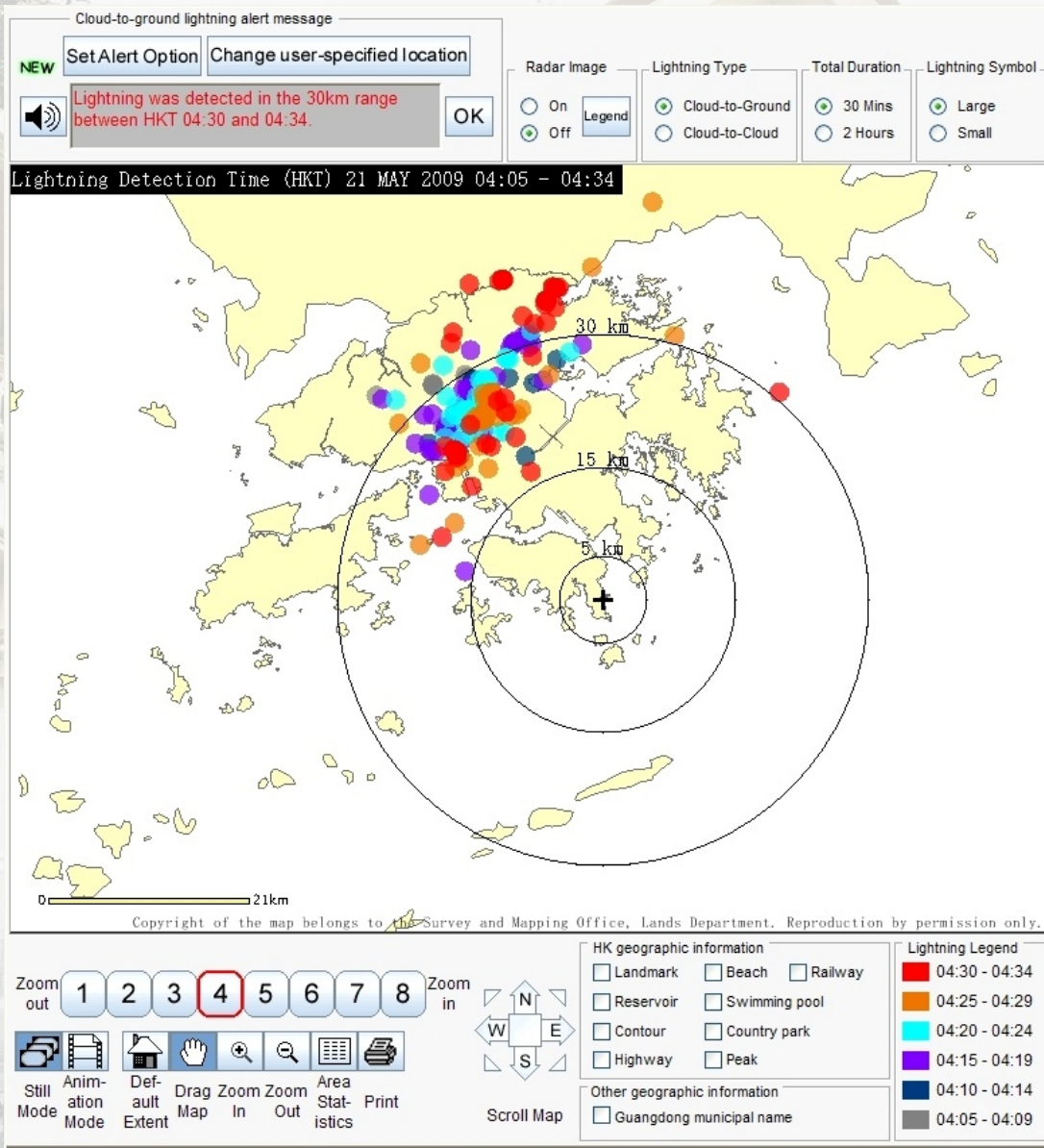
- Jointly established by HKO, Guangdong Meteorological Bureau (GMB) and Macao Meteorological and Geophysical Bureau (SMG)



# HKO's Location-specific Lightning Alert Service (LLAS) webpage

[http://www.weather.gov.hk/wxinfo/llis/alert\\_index.htm](http://www.weather.gov.hk/wxinfo/llis/alert_index.htm)

- User may select his/her own place of interest AND up to 3 range rings
- When lightning is detected within any of the range rings, a user-selected audio alarm sounds, plus a visual alert



# Socio-economic benefits of LLAS

- Enhanced safety of people taking part in outdoor activities
- Improved efficiency and reduced complaints from users of outdoor facilities (e.g. swimming pools)
- Increase in working time for lightning sensitive industries
- Increase in revenue of public/private swimming pools due to the increase in opening hours



# Socio-economic benefits of LLAS

## Case Study – ‘public’ swimming pools

- Methods used – survey and economic model
- Data source – information from HKO colleagues in charge of the LLAS
- Data – one typical swimming pool operator indicated that after using the LLAS, the *opening hours have increased by about 20%*





# Case Study – Public Swimming Pools

- Assumptions/estimations :
  - About 500 public outdoor swimming pools in HK
  - Each opens for ~ 10 hours per day in summer (May to Sep)
  - Entrance fee per person ~ HK\$20
  - Typically each swimmer swims for ~ one hour
  - As lightning activities are rather random in HK, the experience of the swimming pool operator who reported 20% increase in opening hours is considered applicable to ALL swimming pools
  - Estimated revenue gain if all swimming pools operate with reference to LLAS :  
$$500 \text{ (pools)} \times 150 \text{ (days)} \times 10 \text{ (hrs)} \times 100 \text{ (persons)} \times \$20 \times 20\%$$
  
**= HK\$30 million per year**



# Costs of Running LLAS

- Capital costs of LLAS ~ HK\$ 8.5 million. Assuming a ten-year useful lifetime of the system, annual cost ~ HK\$ 0.85 million
- Annual running costs of LLAS ~ HK\$ 0.4 million
- Total annual costs ~ HK\$1.25 million
- Much less than the potential revenue gain of public swimming pools ALONE



# Room for improvement in the assessment

- Collect more data from swimming pools (e.g. a survey)
- Collect data from other stakeholders (e.g. construction companies, power companies)

Thank You

