DHEC
PROMOTE PROTECT PROSPER

Bureau of Air Quality

AERMOD EXPERIENCES

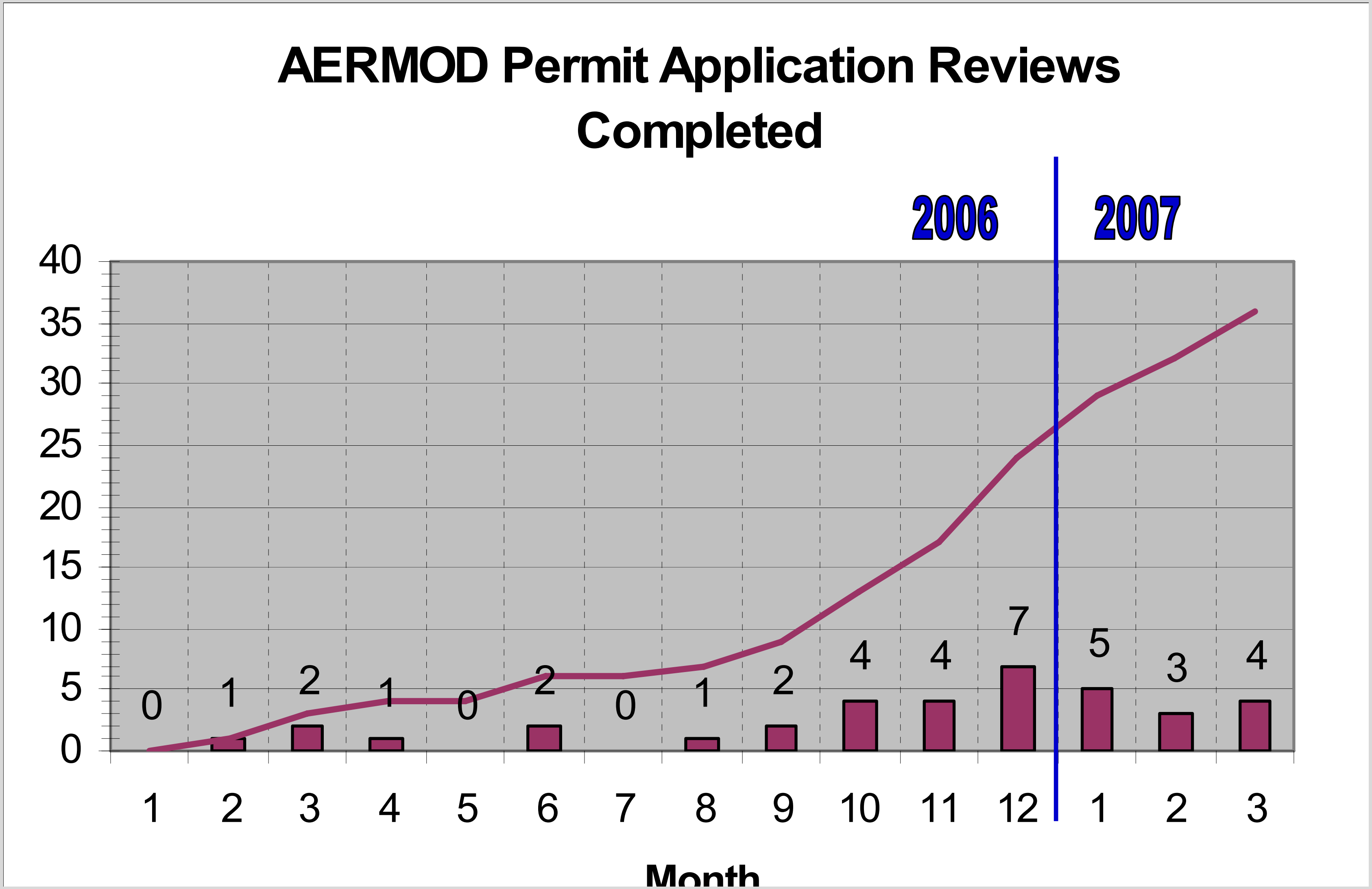
SC-DHEC BAQ

Region 4 Regulatory Modelers Workshop
March 28, 2007

TOPICS

1. How “experienced” are we?
2. Long run times
3. AERMAP
4. Met. Files / AERMET
5. Miscellaneous

Our "Experience"

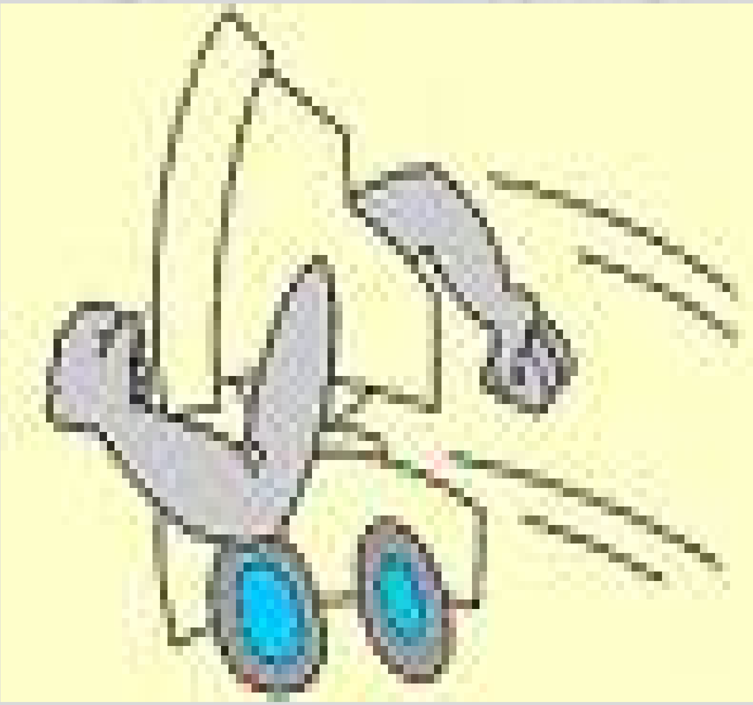


Our “Experience” (cont’d)

- **So far through 3/23/07**
  - 36 AERMODs reviewed (permit applications)
  - mostly Minor Source
  - 1 PSD completed (2 in progress)
  - 1 “Urban” (USC Columbia)
  - Additional 3-4 non-permit (MACT)

Long Run Times

ISCST3



AERMOD

"Ballpark" Runtimes

Rel. Size	# Sources	# Recep.	# DEM Quads 7.5-min	TIME: AERMAP	TIME: AERMOD Pollutant/yr	TIME: AERMOD 5 Pollutants & 5 yrs
Small	3	1528	4	6 min	0.5 hrs	12.5 hrs
Medium	49	3315	4	30 min	1.5 hrs	37.5 hrs
Large	75	11,137	6	3 hrs	19.5 hrs	487.5 h (20 days)
PSD	168	40,097	6 (1°)	96 hrs (4 days)	312 hrs (13 days)	325 days

Computer Resources

►Starting Out:

- Desktops: - Pentium 4 (3.4 GHz)
  - 2 GB RAM, 150 GB
- OK for small/medium runs
- Inadaquate for:
  - multiple projects, PSD's
  - expedited permit review (coming)
  - slows other applications

Computer Resources (cont'd)

► **ADDED**
- **Server …**2 processors (3.4 GHz), 3.7GB RAM, 1 TB
- **2 Stand-alone PC's**
  Pentium 4, 1-2 GB RAM, 120 GB
- **Similar run-times (Server fastest ?)**
- **Coordination & prioritization !**

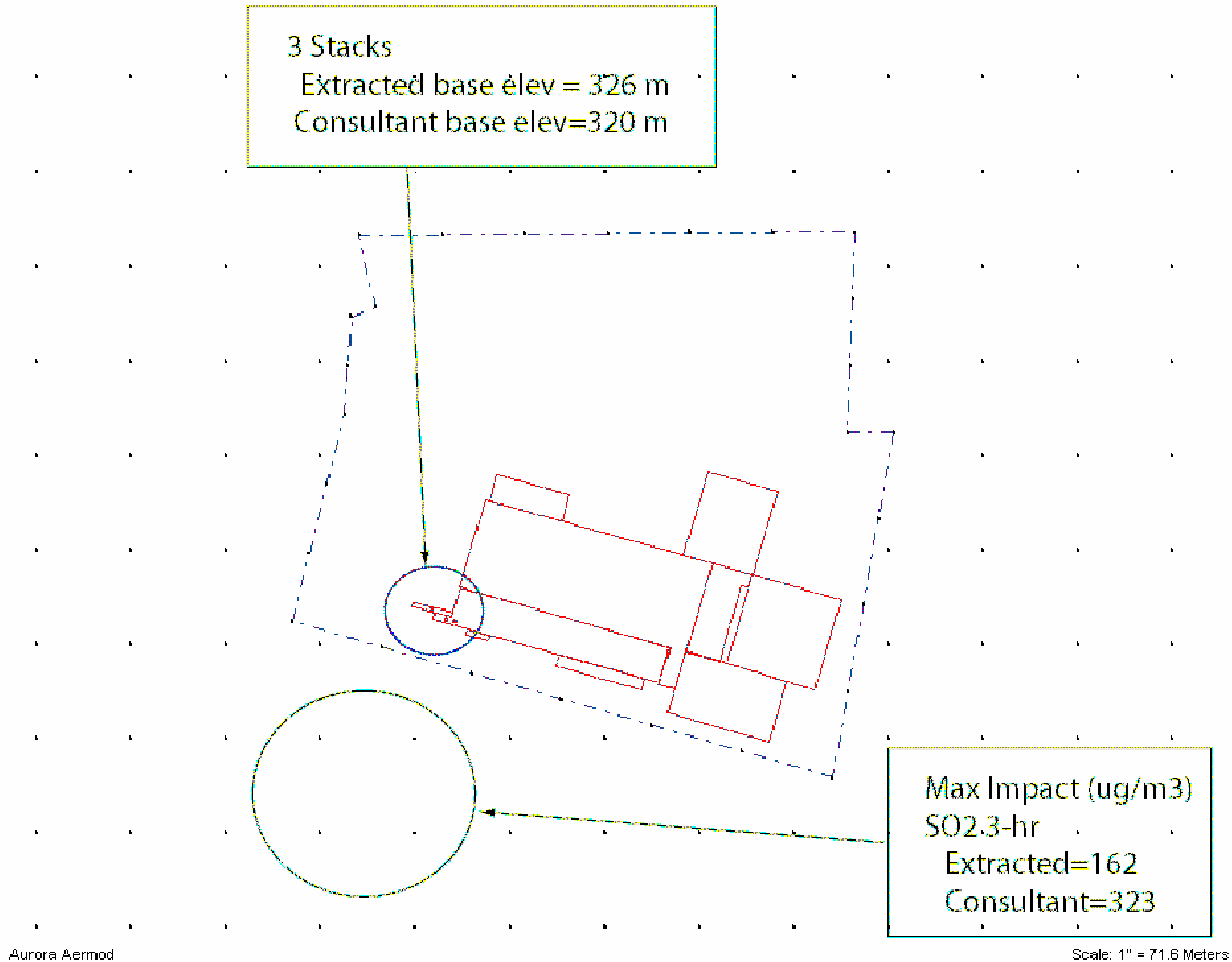
► **FUTURE**
- **Biennial desktop upgrade (↑RAM, dual core ?)**
- **Quad-core server ?**

AERMAP

► Elevation extraction

- BAQ extracts all objects by default
- Facilities may supply (non-extracted) elev's
- May significantly impact model results
- Examples

EXAMPLE 1 – Traveler's Rest, SC



>> Supplied elev's -- MORE conservative results

Example 2 -- Charleston, SC

	Source/Bldg Elev.	PM10 24-hr Max. Mod. Conc. (ug/m3)	Std. 7 Limit (ug/m3)
Supplied	8 m	29.1	30.0
Extracted	6 – 7 m	31.4	

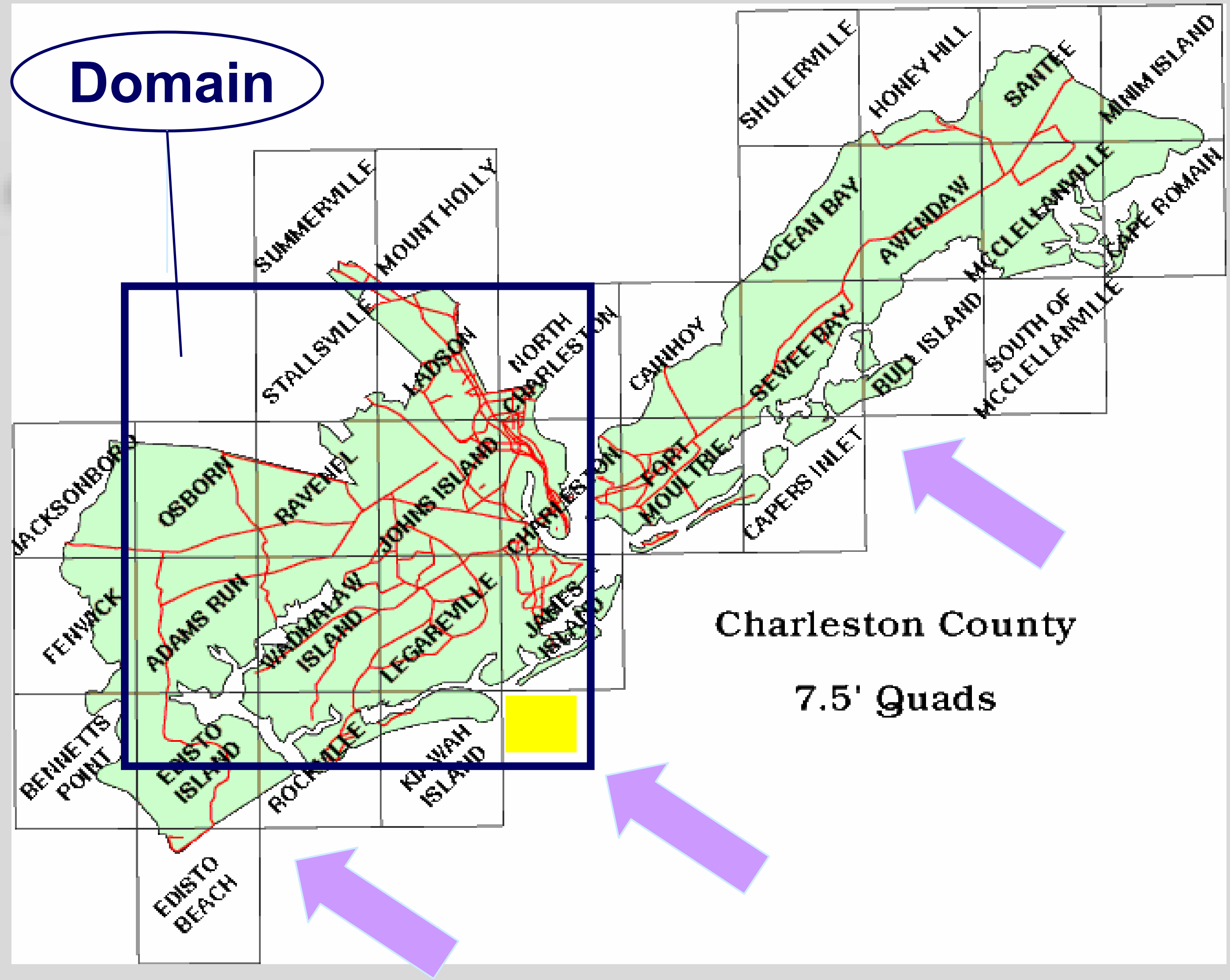
>> Supplied elevations – LESS conservative results

AERMAP (cont'd)

- **DEM QUADS:**
  - Primarily use 7.5-min
  - Use 1-deg for:
    - PSD's

      (e.g., 90 7.5min or 6 1-Deg ?)
    - Off-coast coverage

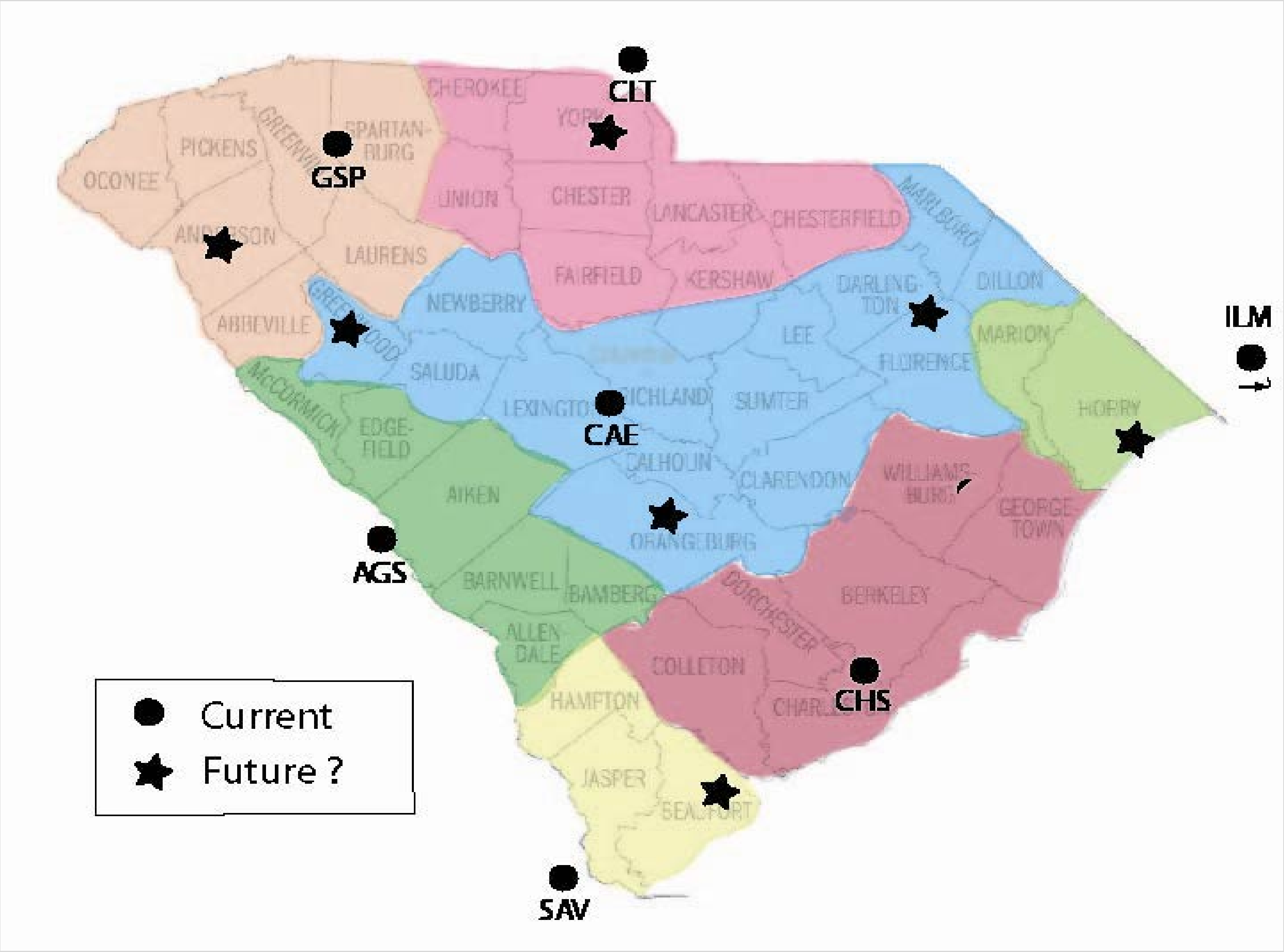
7.5 min DEM Coastal Coverage



MET Data / AERMET

- **Pre-processed met data on website**
  - same stations as ISCST3
  - Process:
    - SCRAM TD-1440, 1987-'91
    - Calpuff terrain pre-processor
    - AERSURFACE
    - AERMET

AERMET Surface Stations



MET Data / AERMET (cont'd)

- **Plan: Increase density of sfc met stations**

  - ↑ representativeness of met. / sfc characteristics

  - New = ISHD (ASOS) 2002-2006

  - Old = 1987-'91 ?

Miscellaneous

1. Receptors - decrease range to decrease runtimes (5km to 1.5km)
2. UTM coordinates – not accepting plant-relative -- facilitates BAQ review
3. Horiz/raincapped stacks – consultants slow to use adjustments correctly

Questions?
Comments?
Steve Smutz: smutzsw@dhec.sc.gov
John Glass (Mgr): glassjp@dhec.sc.gov