# Input Data Set Construction

## Part (2)
## Growth Profile Development

# Introduction

- Growth profile definition:

  "A growth profile describes how an assigned growth surrogate impacts an emission source category over time."

- CEFS will no longer support ARB's former growth category level information
- CEFS requires growth surrogates to be linked directly to an emission "category" in the inventory

# Preliminaries

- Things to consider when constructing growth profiles
  - Remember that growth affects all pollutants equally
  - Define the emission categories that should be grown by a given surrogate
  - Determine if historical and projected data exist for the growth surrogate
  - Check if data exist at the desired geographical level of detail
  - Examine the relational links between the growth surrogate and inventory (i.e. EIC/SCC/SIC etc.)

# Growth Data Relationships in CEFS

- Parameter Assignment Data (PAD)
  - region_id
  - category_id
  - parameter
- Growth Activity Profile (GAP)
  - region_id
  - parameter
  - year
  - activity

# PAD
# Parameter Assignment Data

# Growth Data Hierarchy

Region Selection:

1. District, Air Basin, County, Sub-County
2. District, Air Basin, County
3. Air Basin, County
4. County
5. Air Basin
6. District
7. California

Category Selection:

1. Facility, SCC, SIC
2. Facility
3. Facility, EIC
4. SCC, SIC
5. SCC6, SIC
6. SCC3, SIC
7. SCC
8. SIC
9. EIC, SIC
10. EIC
11. CES
12. SIC2
13. Facility, EIC, SIC

Note: Currently, options 1,2,3, and 13 are only available with GIS forecast module

# ARB or the District has to define the growth parameter assignments

- ARB can define default growth parameter assignments
- If none assigned, the growth factor in the forecast table defaults to 1.0

# Parameter Assignment

- Complex
- Ideally consistent with process rate or emission generating activity
- Growth surrogate
  - logical or intuitive assignment
  - previous assignment
  - EPA and/or EIIP has guidelines for some, but not all, sources

# Assignment of growth parameter - EI category links

- Stationary Point Sources
  - category_flag= 7 (SCC)
  - category_flag=12 (SIC2)
- Area-wide and Aggregated Point Sources
  - category_flag= 9  (EIC,SIC)
  - category_flag=10 (EIC)
  - category_flag=11 (CES)

# Examples of Parameter - EI Category Links

- Electric Utilities - point source
  - by SIC2 parameter='TOTAL-CO-EMP'
- Landfill - Aggregated point
  - by CES parameter='POP-DOF'
- Adhesives & Sealants - Aggregated point
  - by CES parameter='MFG-TOTL'
- Architectural Coatings - Area-wide
  - by CES parameter = 'DWELLUNT'

# GAP
# Growth Activity Profile

# Growth data in the GAP table are measurements of the growth parameter

- Generally raw activity data
- Examples:
  - pop = people
  - mfg-totl = $ output in SIC 20-39
  - services-emp = # employed in SIC 70-89

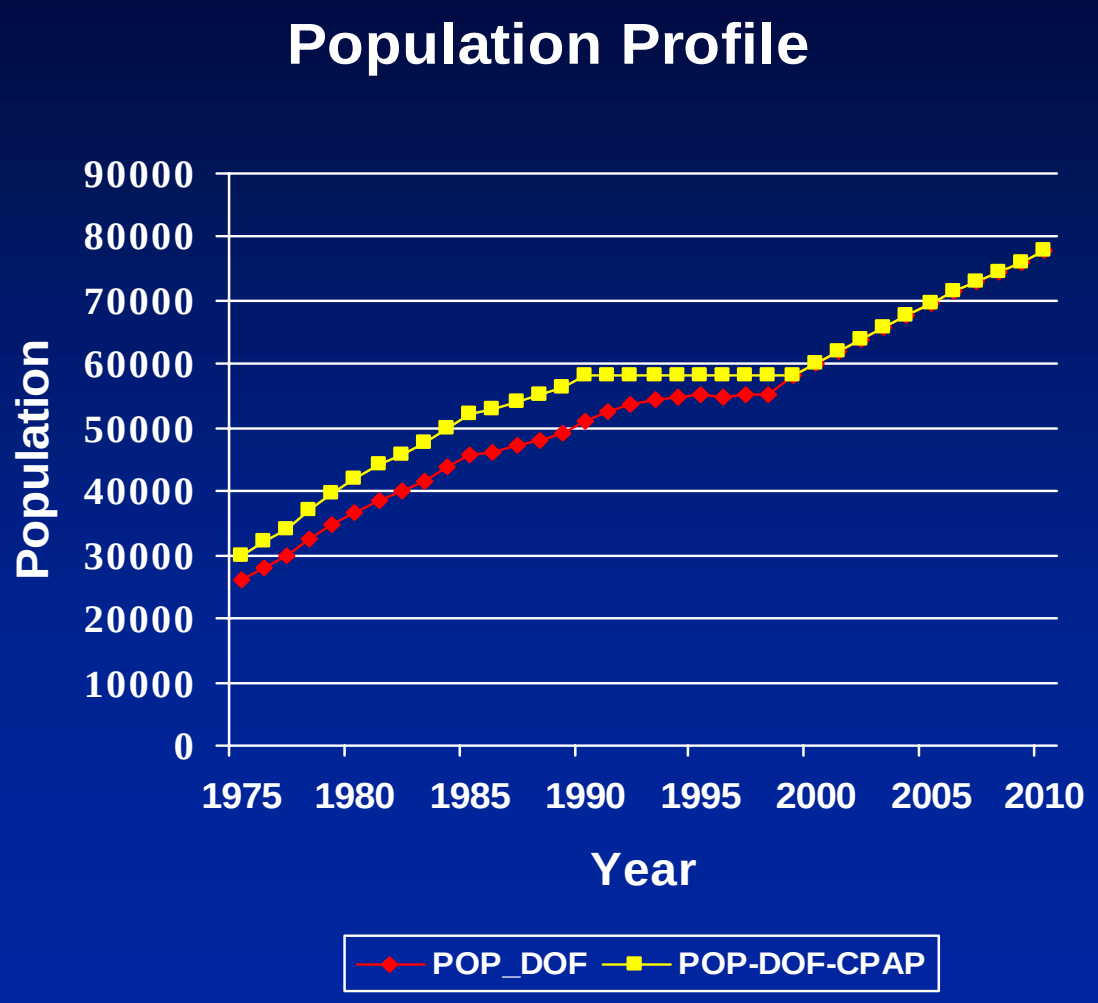
# Growth Profile over time

- Years 1975-2020
- If raw activity data only for years 1990 and 2010
  - Forecast program
    - interpolate year 1995 activity data
    - extrapolate years 1975 and 2020 activity data
  - ARB can attach related trend to district data

# Sample Growth Profile Adjustment (1)

- Consumer Aerosol Coatings EIC=510-500-9xxx-0000
  - Grown by POP-DOF, <u>except</u>
  - No growth assumption 1990-1999
  - parameter=‘POP-DOF-CPAP’ (adjusted population)

# Sample Growth Activity Profile(1)

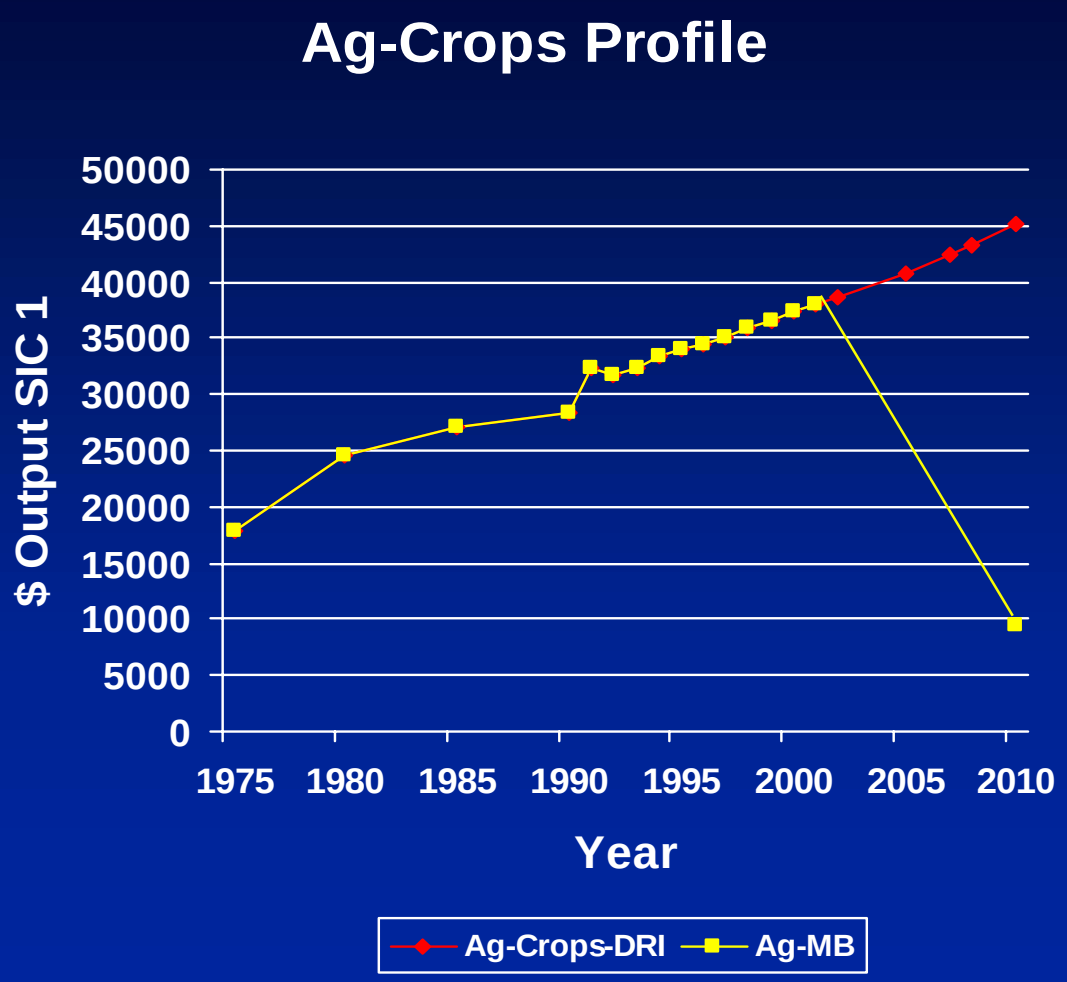



| YEAR | POP-DOF | POP-DOF-CPAP |
|---|---|---|
| 1985 | 45600 | 52158 |
| 1986 | 46300 | 52959 |
| 1987 | 47300 | 54103 |
| 1988 | 48200 | 55132 |
| 1989 | 49200 | 56276 |
| 1990 | 51000 | 58335 |
| 1991 | 52500 | 58335 |
| 1992 | 53700 | 58335 |
| 1993 | 54300 | 58335 |
| 1994 | 54700 | 58335 |
| 1995 | 55100 | 58335 |
| 1996 | 54900 | 58335 |
| 1997 | 55100 | 58335 |
| 1998 | 55100 | 58335 |
| 1999 | 58335 | 58335 |
| 2000 | 60072 | 60072 |
| 2001 | 62080 | 62080 |
| 2002 | 64047 | 64047 |
| 2003 | 65967 | 65967 |
| 2004 | 67857 | 67857 |
| 2005 | 69705 | 69705 |

# Sample Growth Profile Adjustment (2)

- Pesticide: Ag methyl-bromide
  EIC=530-530-3225-0000, CES=83550
  - Grown by AG-CROPS ($ output SIC 1) till 2001
  - 1/3 1990 value by 2010 because Montreal Protocol
  - parameter='AG-MB' (adjusted $ output SIC 1)

# Sample Growth Activity Profile(2)

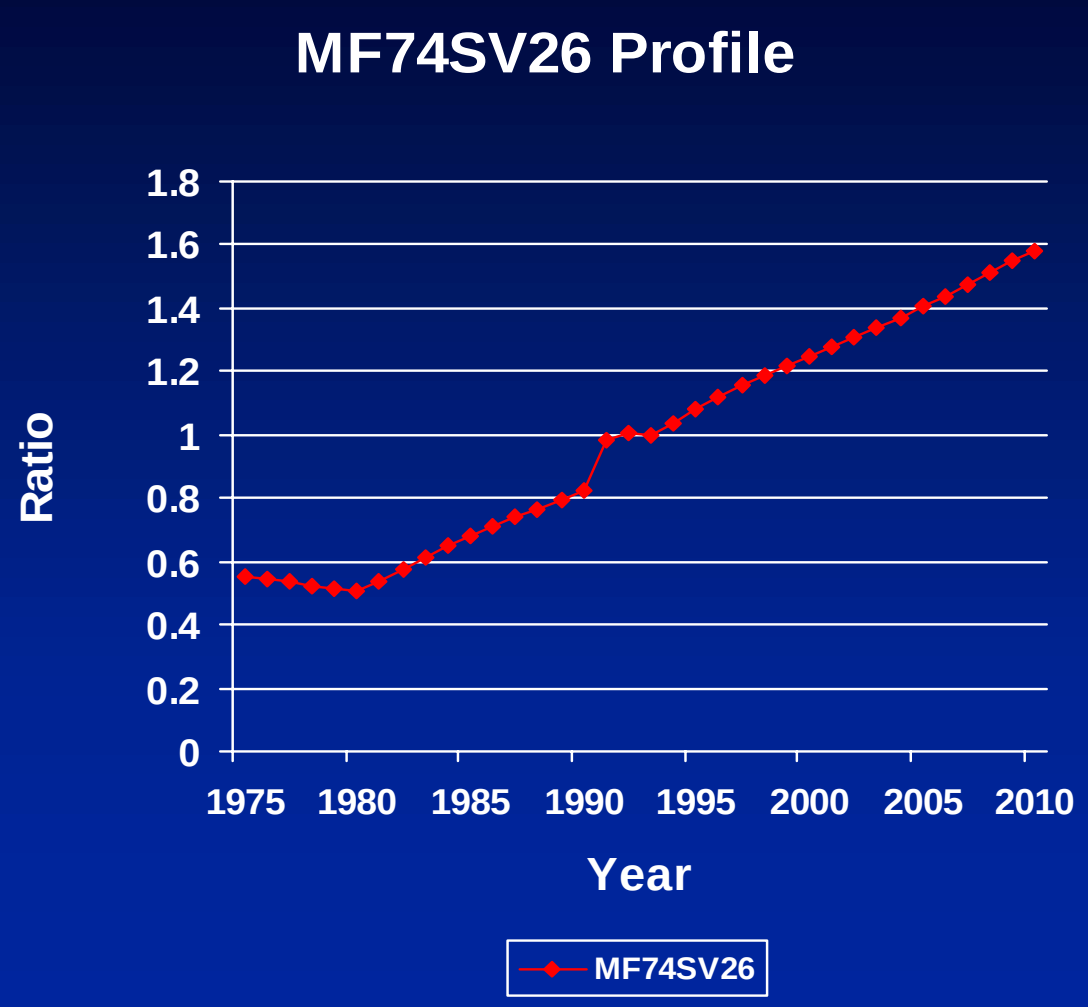



| YEAR | Ag-Crops-DRI | Ag-MB |
|---|---|---|
| 1990 | 28267 | 28267 |
| 1991 | 32250 | 32250 |
| 1992 | 31749 | 31749 |
| 1993 | 32250 | 32250 |
| 1994 | 33389 | 33389 |
| 1995 | 34027 | 34027 |
| 1996 | 34494 | 34494 |
| 1997 | 35166 | 35166 |
| 1998 | 35970 | 35970 |
| 1999 | 36655 | 36655 |
| 2000 | 37359 | 37359 |
| 2001 | 37970 | 37970 |
| 2002 | 38669 | |
| 2005 | 40730 | |
| 2007 | 42344 | |
| 2008 | 43241 | |
| 2010 | 45206 | 9422.333 |

# Sample Growth Profile Adjustment (3)

- Degreasing, Hand Wiping, Petroleum Distillates
  EIC=220-208-0500-0000, CES=83832
  - 74% from industrial, 26% from commercial
  - composite growth: 74% of mfg-totl growth ($ output SIC 20-39) plus 26% services-emp growth (employment SIC 70-89)
  - parameter=‘MF74SV26’ (composite growth ratio)

# Sample Growth Activity Profile(3)




| YEAR | MF74SV26 |
|---|---|
| 1980 | 0.505 |
| 1981 | 0.540 |
| 1982 | 0.576 |
| 1983 | 0.612 |
| 1984 | 0.648 |
| 1985 | 0.683 |
| 1986 | 0.711 |
| 1987 | 0.739 |
| 1988 | 0.767 |
| 1989 | 0.796 |
| 1990 | 0.824 |
| 1991 | 0.980 |
| 1992 | 1.006 |
| 1993 | 1.000 |
| 1994 | 1.033 |
| 1995 | 1.085 |
| 1996 | 1.119 |
| 1997 | 1.156 |
| 1998 | 1.188 |
| 1999 | 1.220 |
| 2000 | 1.251 |

# Growth Data Input Notes

- Reference year must be included for all profiles in a region as described previously for control
- Cannot add overwrite data at the same region_id and category_id level
- Must delete data before new data can be added
- OR, new data must be at a higher priority level
- Look at the entire profile for a parameter, not just a single year

# Growth Data Input Notes (cont)

- PAD parameter must be added before any related GAP profile can be added
- GAP data must be at the same region_id level as the PAD data
- Region_id has higher priority than category_id
- Use the comment field in the PAD and GAP tables to document data sources and assumptions

# Improvements to Growth Data

- Pechan-Avanti contract completed spring 2001
- CEC electric utility projections
- EIIP continuing work