Health Risk Assessment Overview

ARB Compliance Training
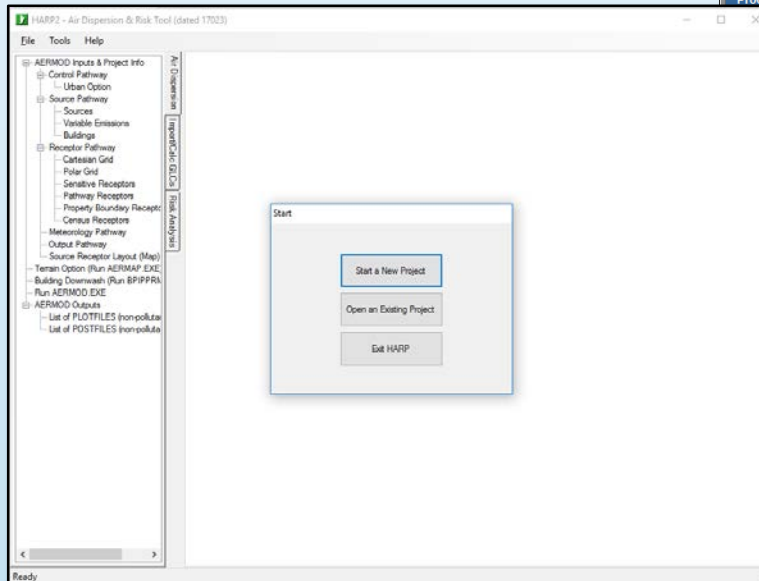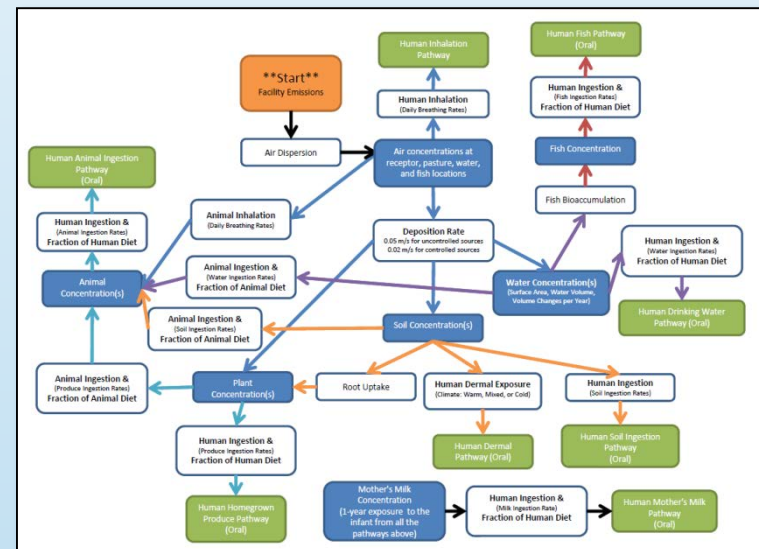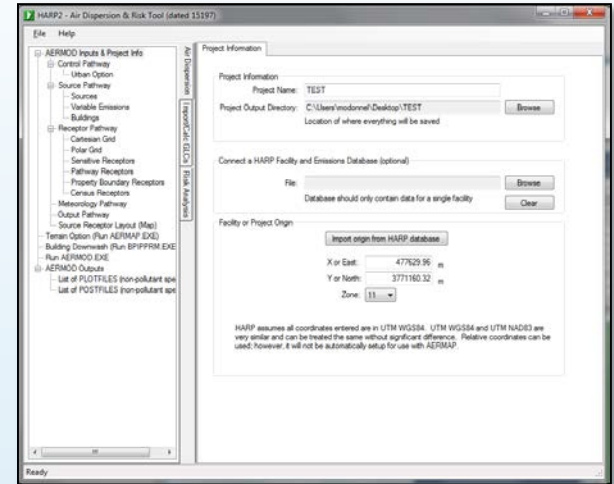
How Do We Model

- Types of Modeling Tools
    - Prioritization
    - Screening
    - Refined
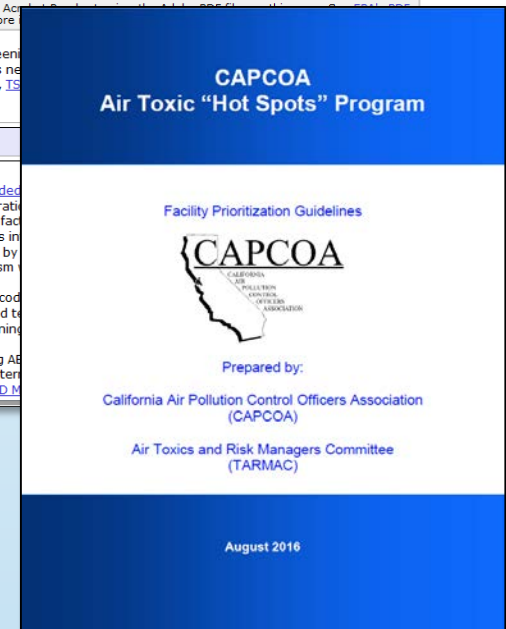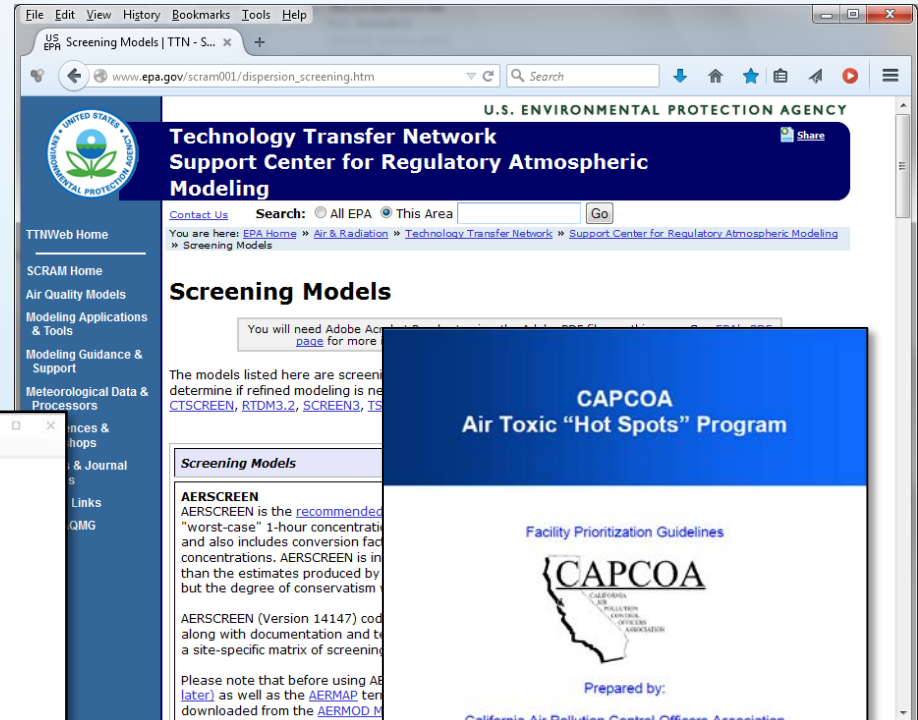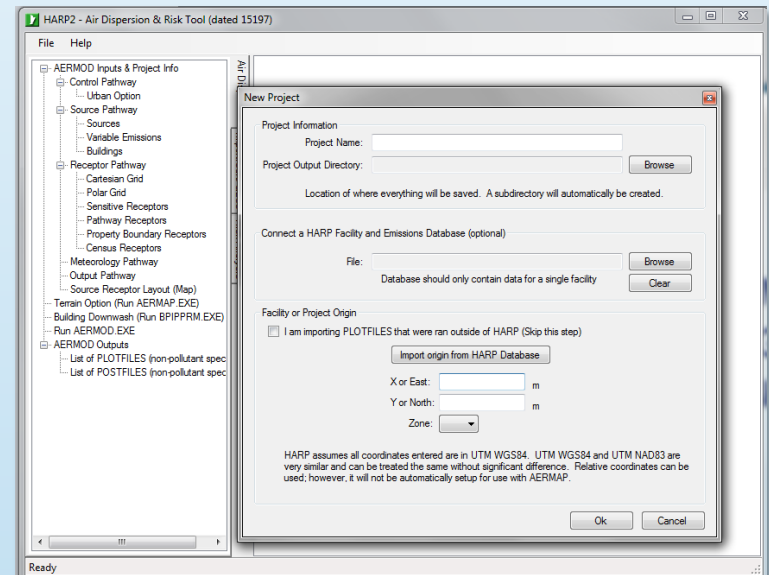
HRA Process

- Refined HRA
  - Consists of Three Parts
    - Dispersion Modeling
    - Calculating Pollutant Specific GLCs
    - Risk Analysis

3

HARP 2

ADMRT

- Run Dispersion Model (AERMOD)

- Calculate Pollutant Specific GLCs

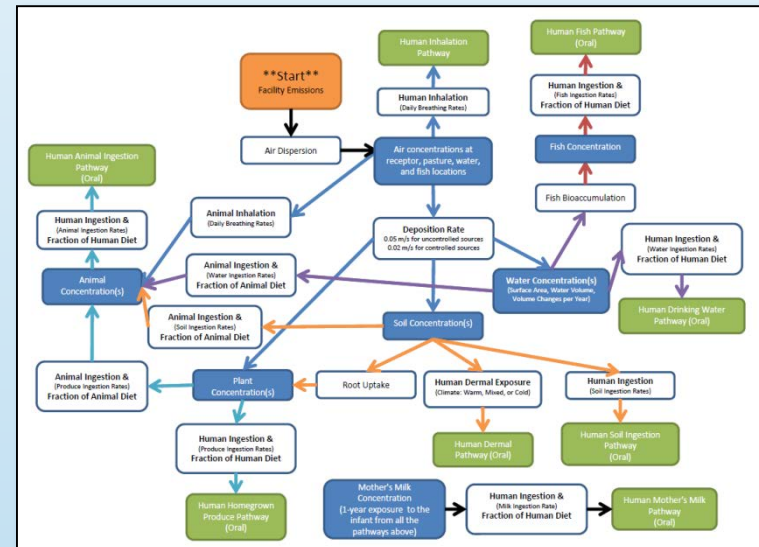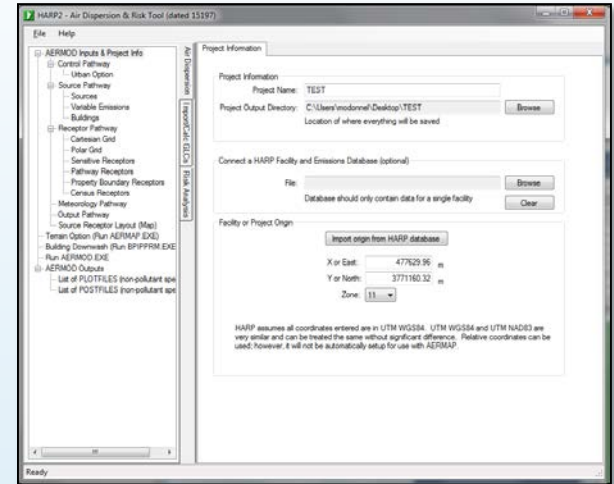- Calculate Cancer Risk and Non-Cancer Hazard Indices

HRA Process

- **Refined HRA**
  - Consists of Three Parts
    - **Dispersion Modeling**
    - Calculating Pollutant Specific GLCs
    - Risk Analysis

AERMOD

- Gaussian Dispersion Model

  - 3D Gaussian Steady State Distribution
  - Normal or bell curve
  - Models dispersion of gasses or particulates downwind of a source
  - Only provides information about downwind concentration not risk
  - All emissions calculated at a rate of 1 g/s or 1 g/s-m^2 for area sources

AERMOD In HARP2

HRA Process

- ## Refined HRA
  - ## Consists of Three Parts
    - Dispersion Modeling
    - **Calculating Pollutant Specific GLCs**
    - Risk Analysis

Calculating Pollutant Specific GLCs In HARP2

Calculating Pollutant Specific GLCs In HARP2

HRA Process

- **Refined HRA**
  - **Consists of Three Parts**
    - Dispersion Modeling
    - Calculating Pollutant Specific GLCs
    - **Risk Analysis**

Calculating Risk Values In HARP2

Air Toxics Hot Spots Program

Risk Assessment Guidelines

Guidance Manual for Preparation of Health Risk Assessments

February 2015

OEHHA HRA Guideline

- Change in Calculation Methodology
- Change in Dispersion Model
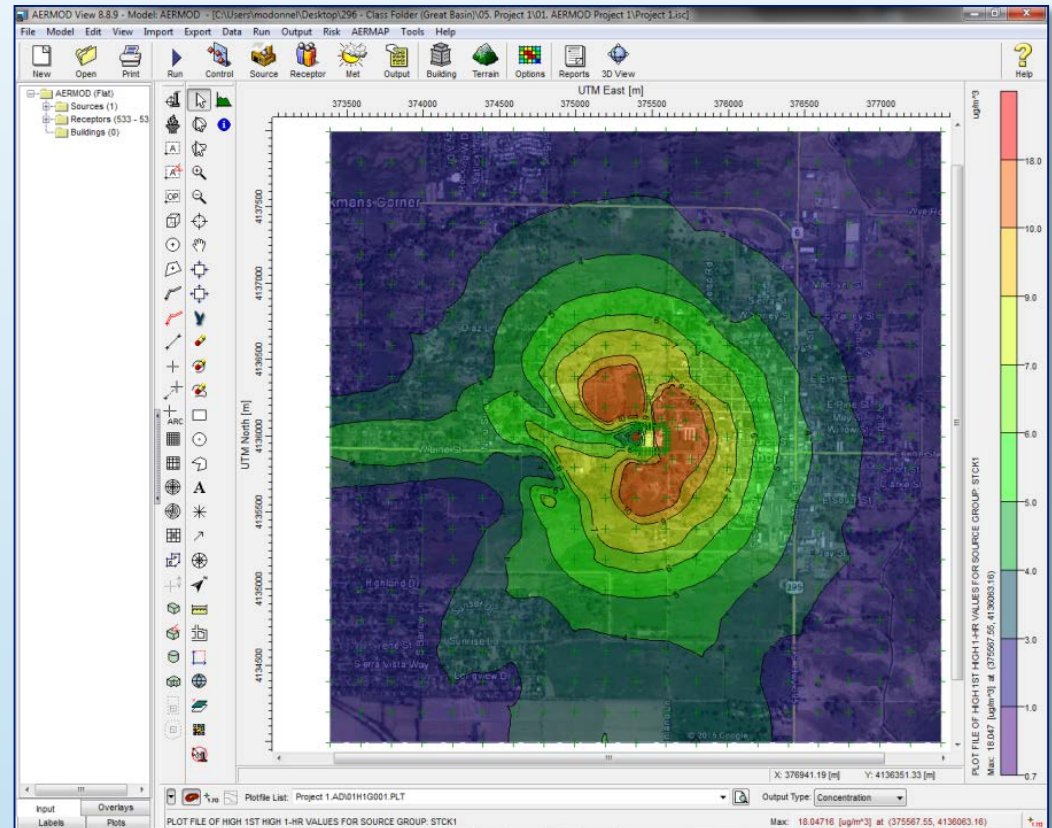
OEHHA Methodology

What's Changed

- Age Bins
  - Breathing Rates
  - Age Sensitivity Factors
  - Fraction of Time at Home (FAH)

- Exposure Periods

- Spatial Averaging

- Calculation of Cancer Risk

Age Bins

Age Bins

- 3rd Trimester
- 0-2 years
- 2-9 years
- 2-16 years
- 16-30 years
- 16-70 years

Rate	3rd Trimester	0 to 2 yrs	2 to 9 yrs	2 to 16 yrs	16 to 30 yrs	16 to 70 yrs
Mean	225	658	535	452	210	185
HighEnd	361	1090	861	745	335	290

Exposure Periods

- Residential Exposure
  - Defaults to 30 yrs (70 yrs)
  - 9 yr Option (Average)
- Worker Exposure
  - Defaults to 25 yrs (40 yrs)
- Population Wide
  - Still 70 yrs

Age Bins

Age Sensitivity

- Accounts for "Early Life" Exposure
- Based on Mean of Postnatal Studies
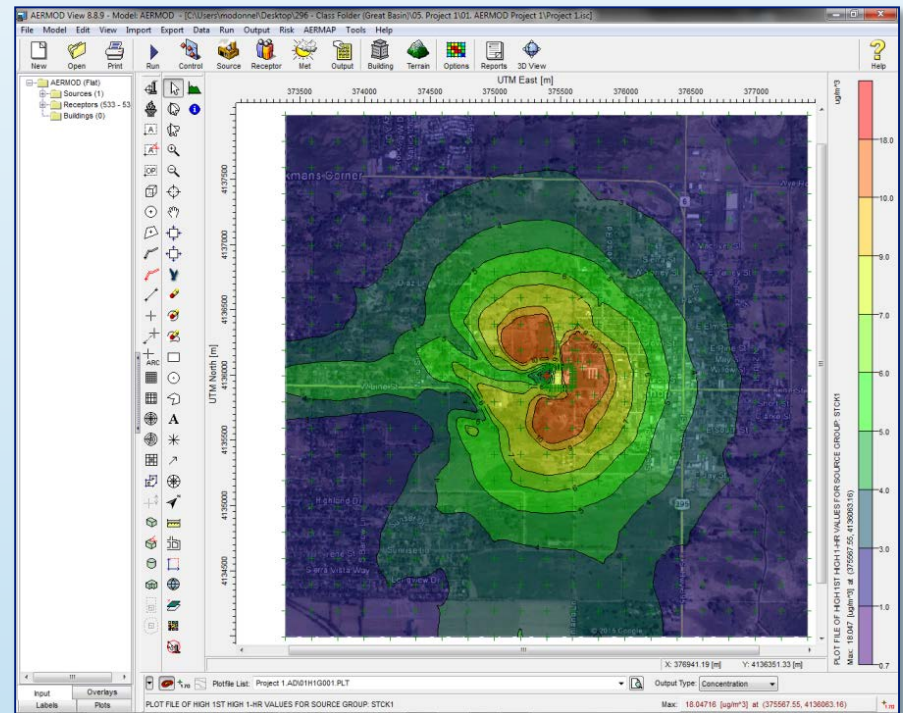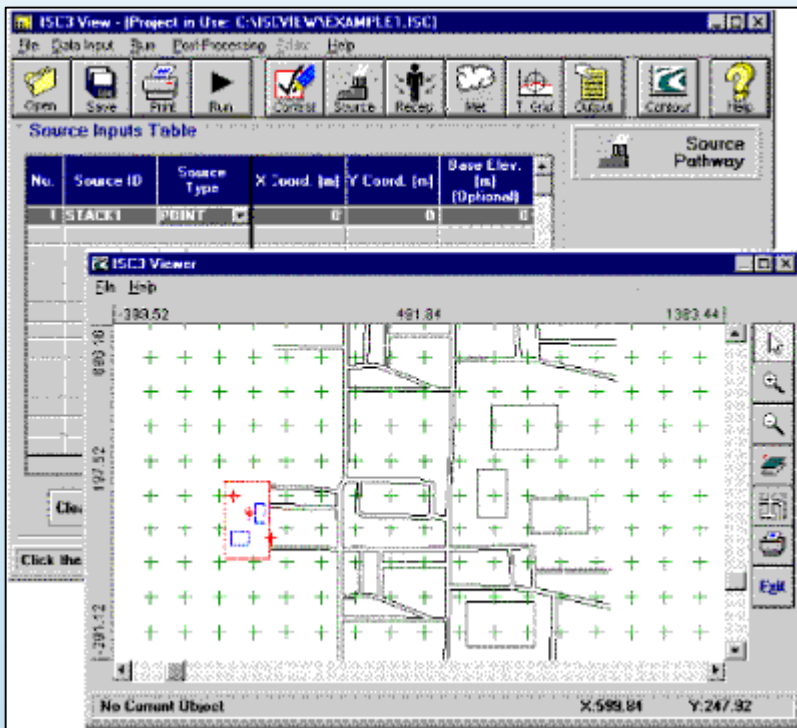
Table 8.3   Age Sensitivity Factors by Age Group for Cancer Risk Assessment

Age Group	Age Sensitivity Factor (unitless)
3rd Trimester	10
0<2 years	10
2<9 years	3
2<16 years	3
16<30 years	1
16-70 years	1

Change in Dispersion Model

- ISCST3 vs. AERMOD
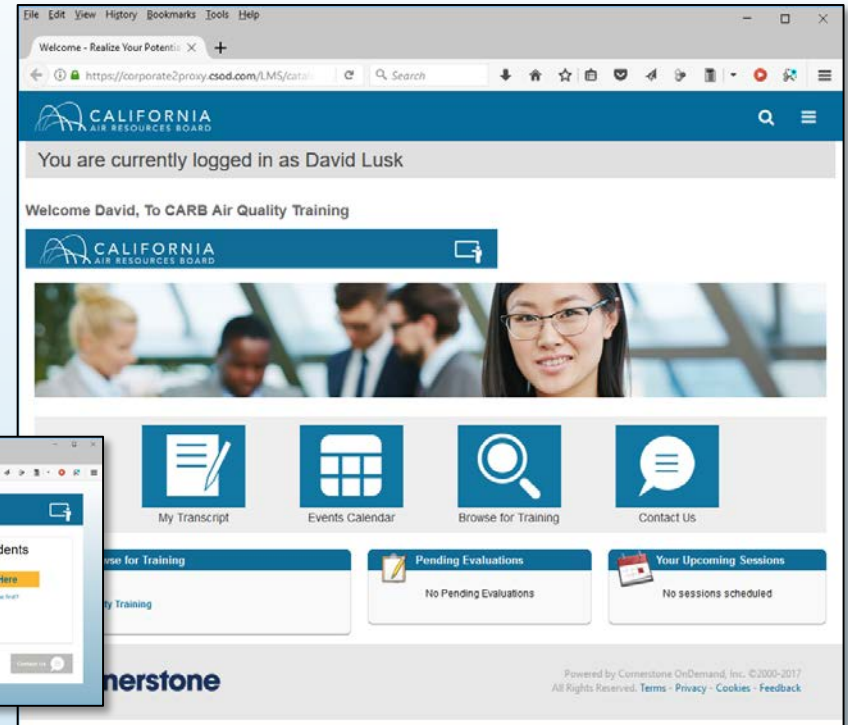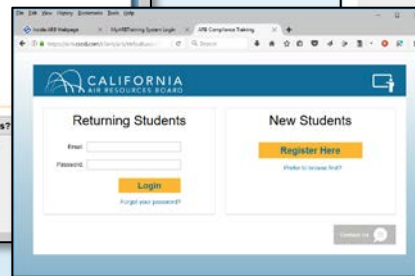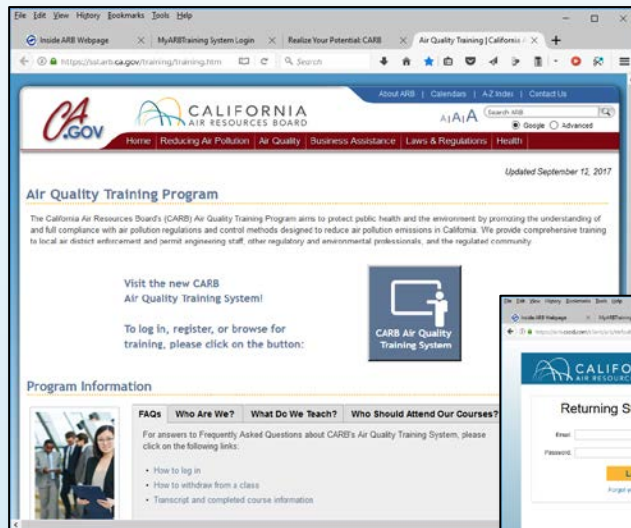- On Average ≈ 1.5 Time Increase
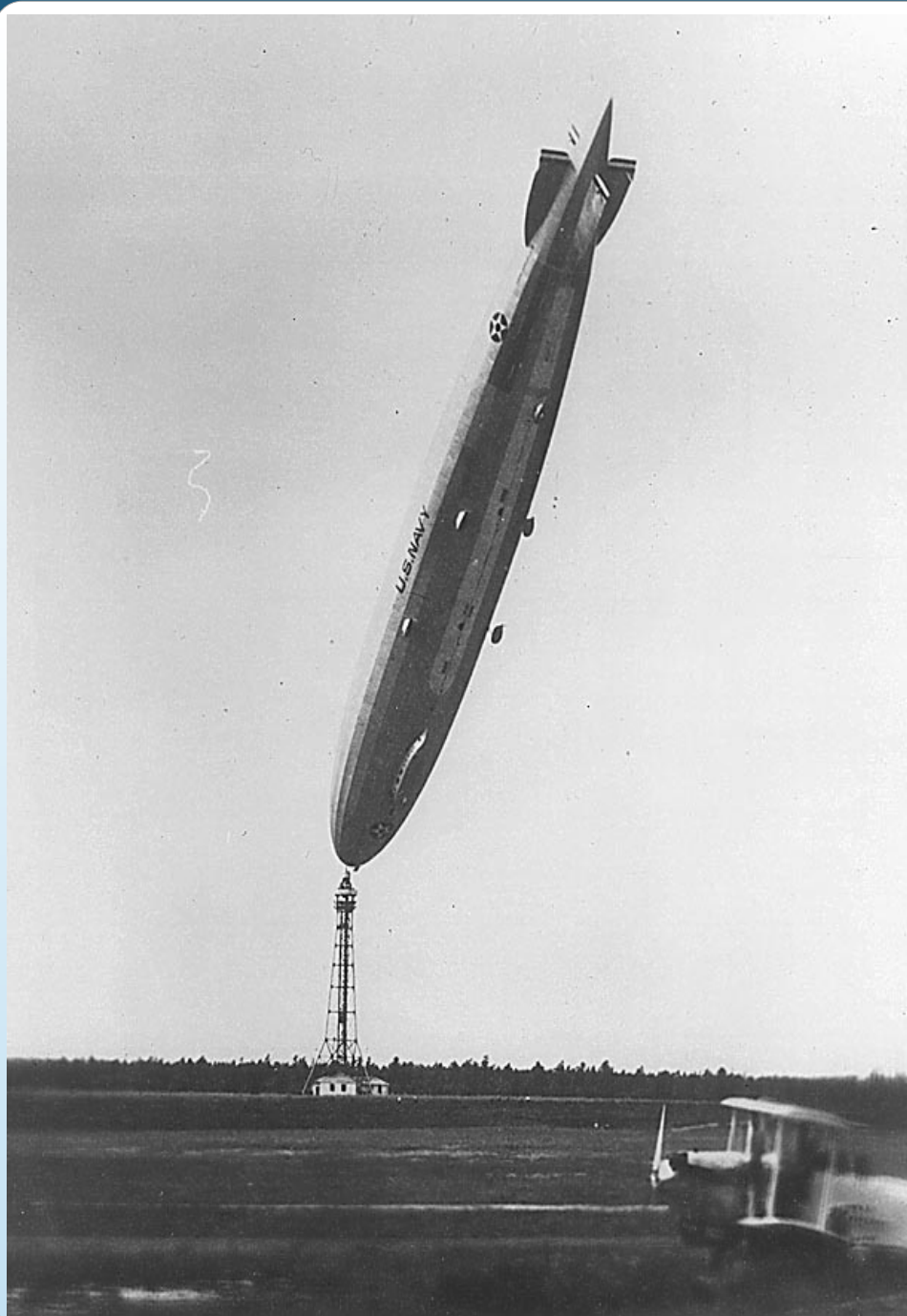
Total Change

- **CASE-BY-CASE**

- Acute Results

  - Essentially Unchanged

- Chronic Results

  - Some Increases/Some Decreases

- Cancer

  - Residential (3-4.5 Increase)

  - Worker (Small Increase)

Shameless Self Promotion Slide

- ## New LMS

- ## New Naming and Numbering Conventions
  - ## MM103 – HRA and Dispersion Modeling
  - ## MM203 – HARP2

Thank You

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