# Methyl Bromide and the Montreal Protocol

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Methyl Bromide Alternatives Outreach Conference

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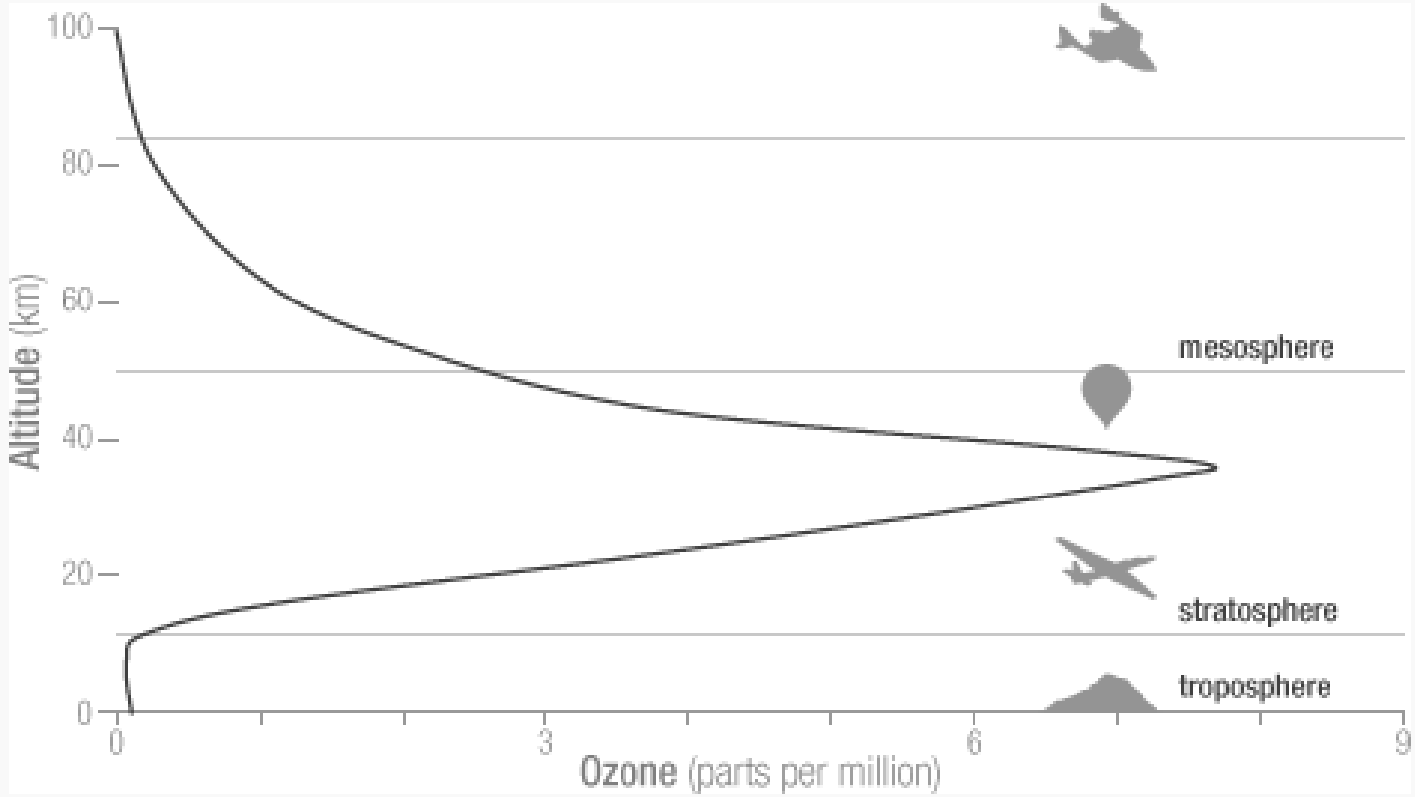
# Ozone Layer



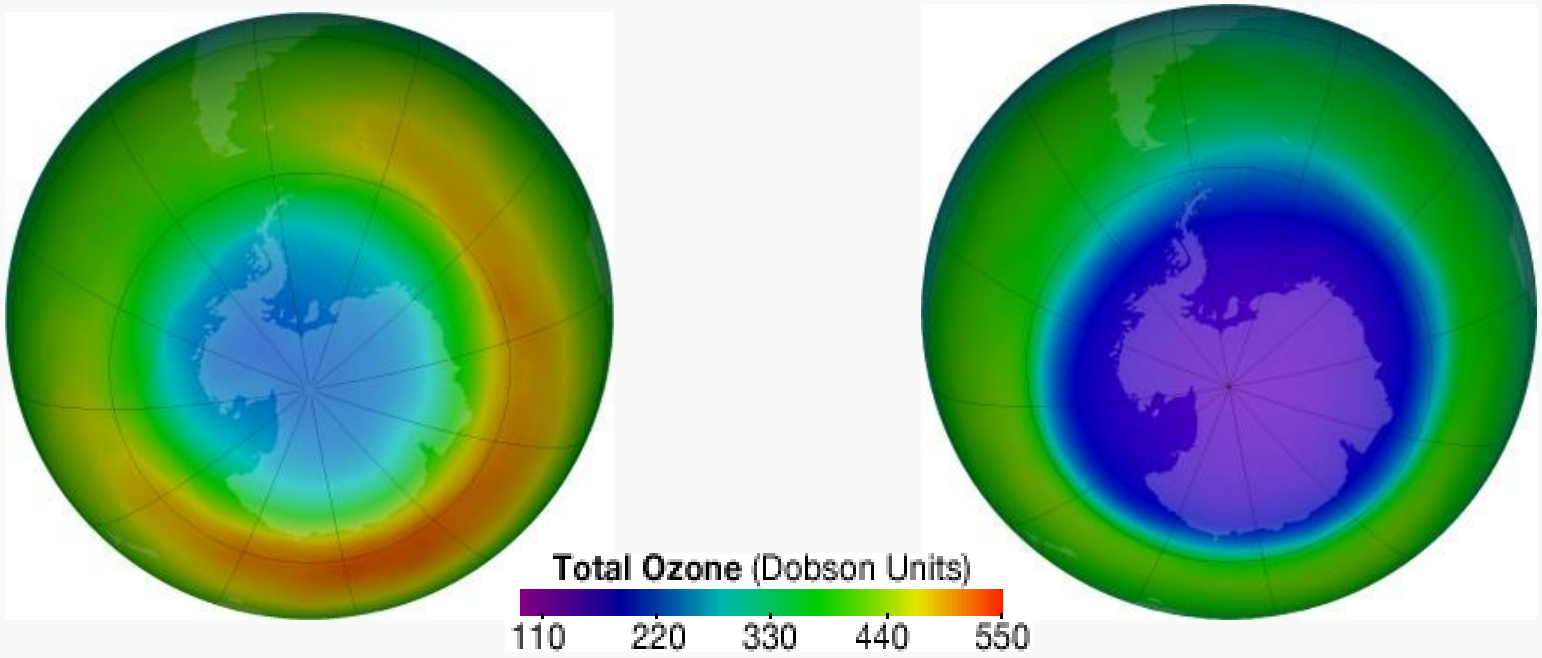

The concentration of ozone varies with altitude. Peak concentrations, an average of 8 molecules of ozone per million molecules in the atmosphere, occur between 30 and 35 km.

Figure: http://ozonewatch.gsfc.nasa.gov/

# Ozone Layer

Ozone over Antarctica
**October 1981**

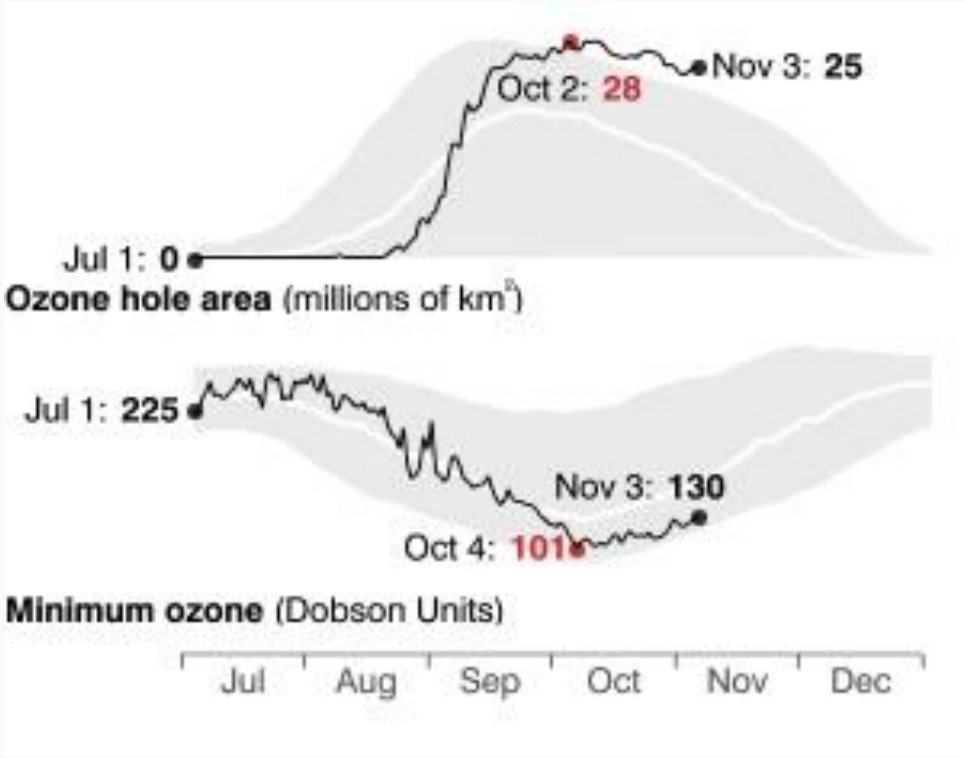
Ozone over Antarctica
**October 2015**




Ozone layer is Earth's "sunscreen" – protects people, plants and animals by absorbing ultraviolet radiation

Figure: http://ozonewatch.gsfc.nasa.gov/

# Ozone Layer




2015 Ozone Hole 3rd largest on record. Due to Antarctic weather conditions. Recovery continues to be anticipated around 2070.

Figure: http://ozonewatch.gsfc.nasa.gov/

# Public Health Effects

- Skin cancer is the most common U.S. cancer
  - Over 3.5 million new skin cancer cases are diagnosed annually
  - More than ***all other cancers combined***
- Lifetime risk of developing melanoma is increasing
  - 1960: 1 in 800 chance
  - 2012: 1 in 50 chance
- Cataracts are the leading cause of blindness worldwide

# Methyl Bromide and the Montreal Protocol

1992: Methyl Bromide added to Montreal Protocol

1995: Clean Air Act required U.S. phaseout by 2001

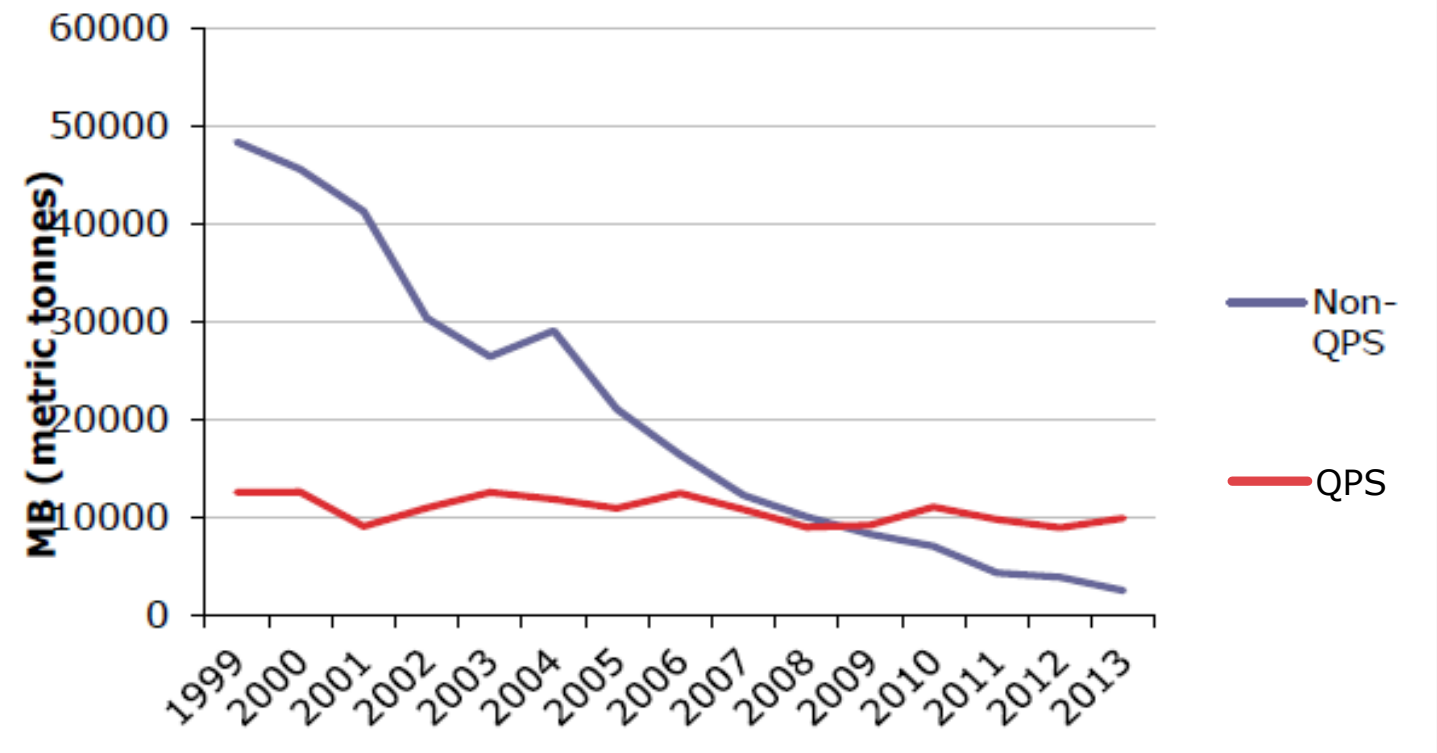
1997: U.S. and international schedule harmonized to a series of step-wise reductions

2005: 100% phaseout in developed countries
- (except QPS and CUE exemptions)

2015: 100% phaseout in developing (A5) countries
- (except QPS and CUE exemptions)

# Global Context

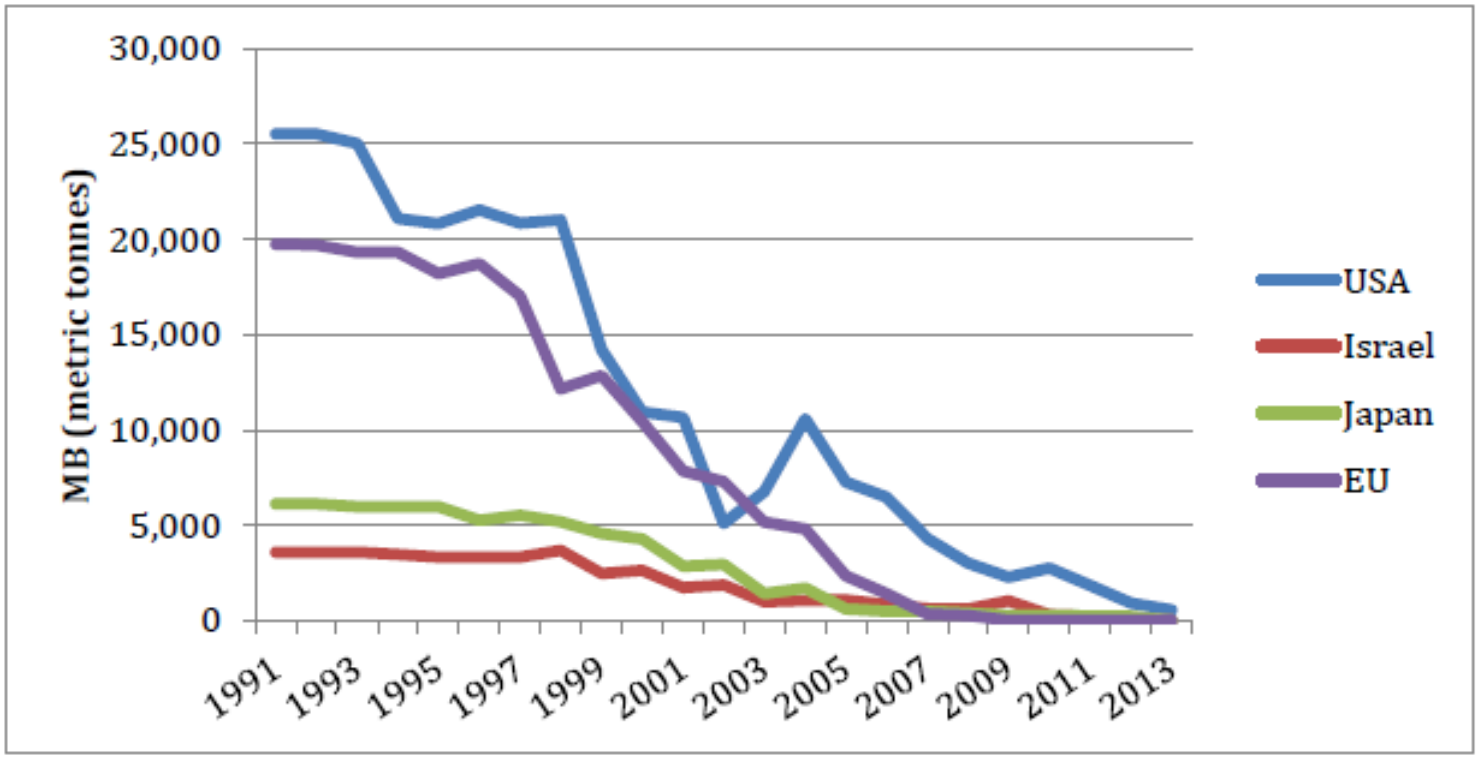
## Methyl Bromide Consumption




Source: 2014 TEAP Assessment Report

# Global Context

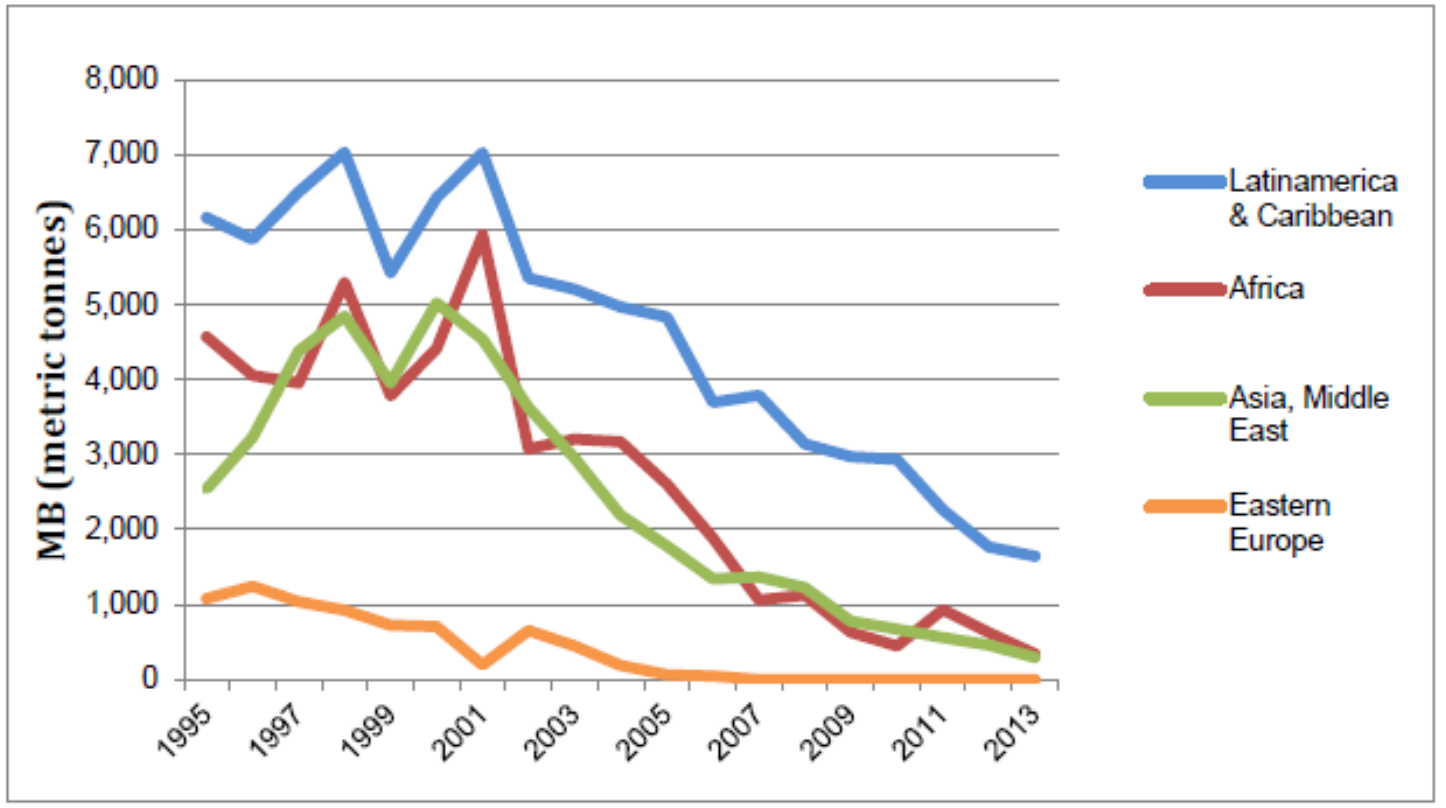
## Non-A5 Methyl Bromide Consumption




Source: 2014 TEAP Assessment Report

# Global Context

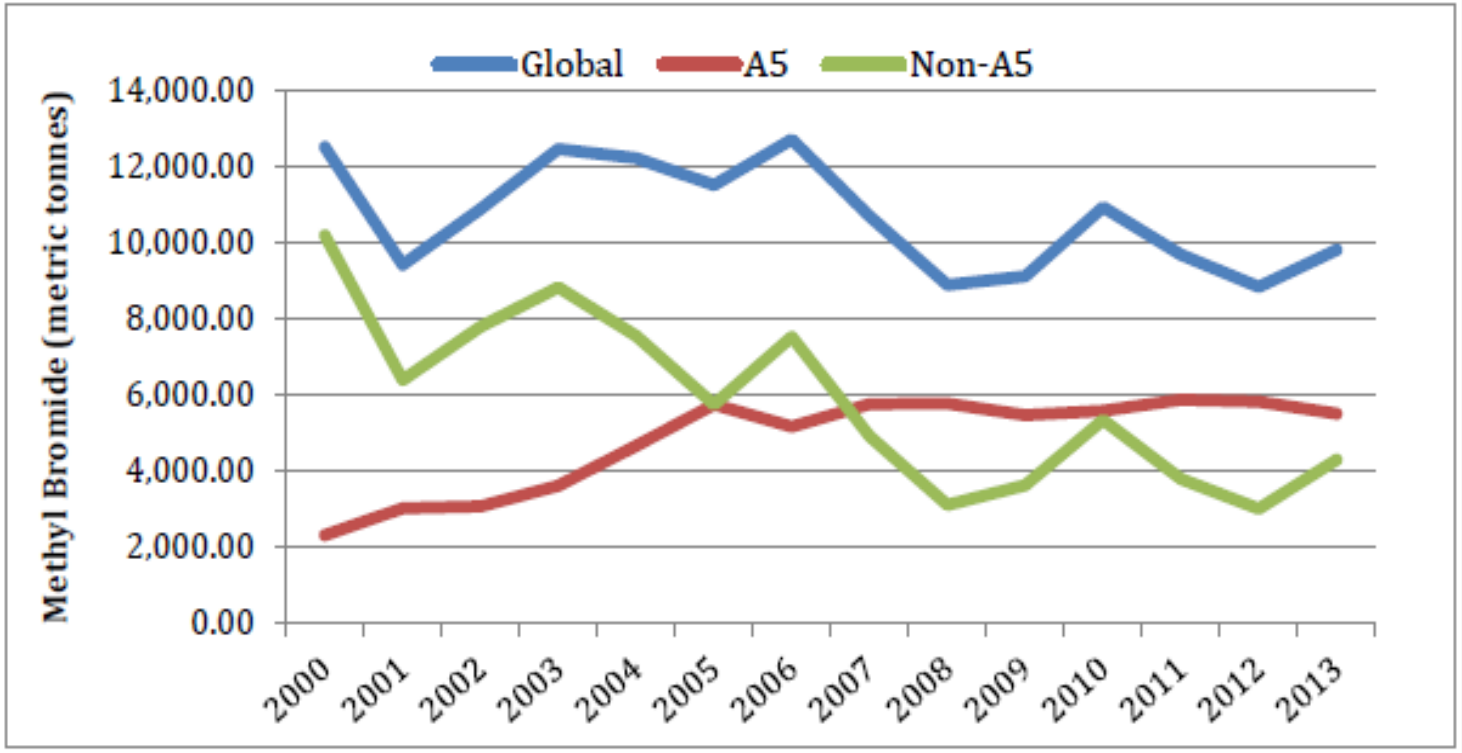
## A5 Methyl Bromide Consumption by Region




Source: 2014 TEAP Assessment Report

# Global Context

## Global QPS Consumption




The majority of A5 QPS use is in the Asia/Pacific region.

Source: 2014 TEAP Assessment Report

# Critical Use Exemption

- Use must meet the criteria in Decision IX/6:
  - No technically or economically feasible alternatives that are:
    - Acceptable from an environmental and health standpoint
    - Suitable to the crops and circumstances of the nomination
  - And, where a lack of methyl bromide would result in a significant market disruption
- In addition, the Party must show:
  - All technically and economically feasible steps have been taken to minimize the critical use and emissions of methyl bromide
  - Research programs are in place to develop and deploy alternatives, and
  - Methyl bromide is not available in sufficient quantity and quality from existing stocks

# Status of U.S. CUEs

- 2015
  - California strawberries (374 MT)
  - Dry cured ham (3.2 MT)
- 2016
  - California strawberries (139 MT)
  - Dry cured ham (1.9 MT)
- 2017
  - Nomination of 3.2 MT for hams withdrawn
  - Decision IX/6: “Methyl bromide is not available in sufficient quantity and quality from existing stocks.”

# Global CUEs

## Authorized critical uses and amounts

| | Sector | 2016 (MT) | 2017 (MT) |
|---|---|---|---|
| **Australia** | Strawberry runners | 30 | 30 |
| **Canada** | Strawberry runners | 5 | 0 |
| **United States** | Strawberry, open field | 232 | 0 |
| | Ham | 3 | 0 |
| **Argentina** | Tomato | 71 | - |
| | Strawberry, open field | 58 | - |
| **China** | Ginger, open field | 79 | - |
| | Ginger, protected | 21 | - |
| **Mexico** | Strawberry runners | 44 | - |
| | Raspberry runners | 41 | - |
| **South Africa** | Mills | 5 | - |
| | Structures | 69 | - |
| **Total** | | **603** | **30** |

# Quarantine and Preshipment

- Quarantine
  - Treatments to prevent the introduction, establishment and/or spread of quarantine pests or to ensure their official control
  - Treatments must be either authorized or performed by a governmental authority (e.g. APHIS or Cal DPR)
  - Includes interstate and inter-county controls
  - Includes soil treatments for propagative material to meet official quarantine requirements of the importing destination
- Preshipment
  - Applications within 21 days of export out of the United States
  - Treatments must meet the official requirements of either the United States or the importing country

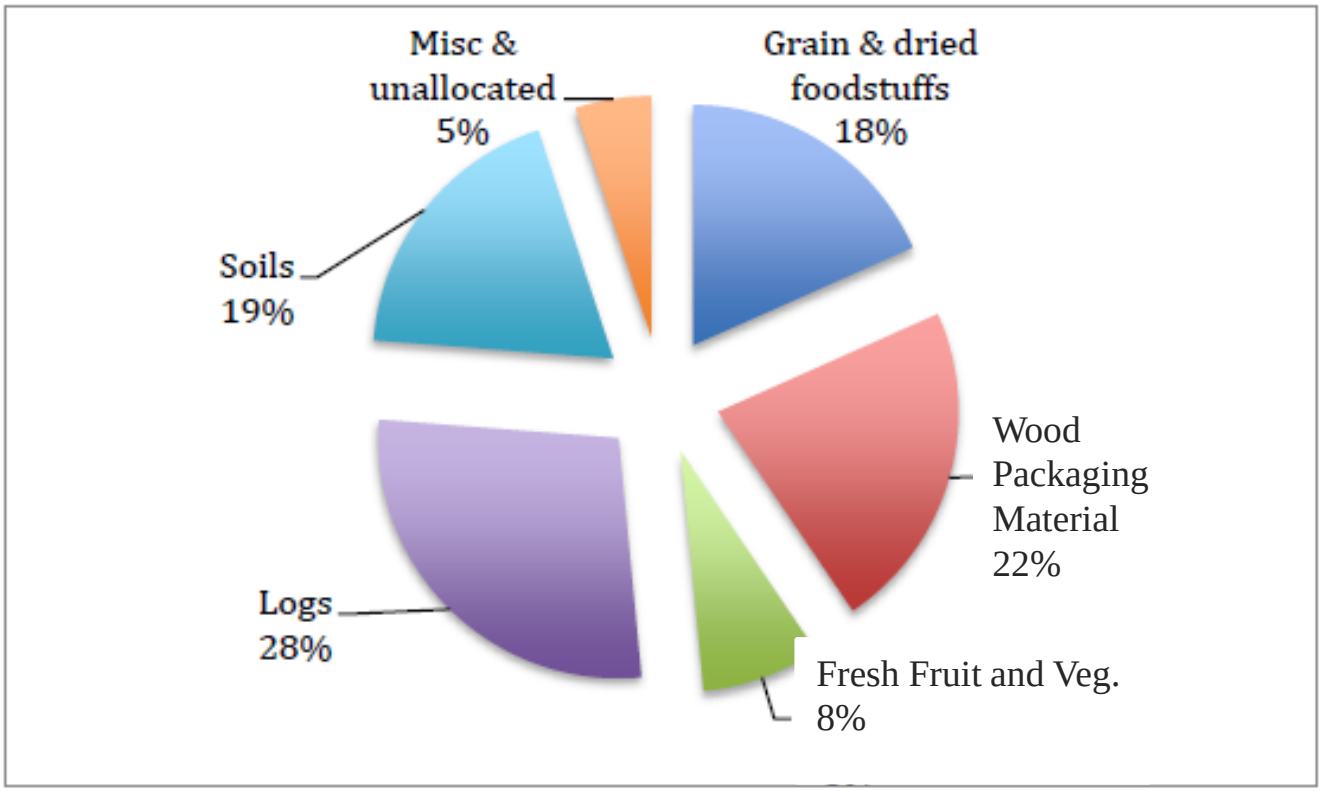
# QPS Resources

- An abbreviated list of quarantine pests:
  - https://www.aphis.usda.gov/plant_health/plant_pest_info/pest_detection/downloads/farmbill/PrioritizedOffshorePestList.pdf
- The APHIS treatment manual:
  - https://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment.pdf
- The Plant Health Board list of state quarantine requirements:
  - http://nationalplantboard.org/laws-and-regulations

**QPS methyl bromide may not be used in residential structures or in public food service facilities, such as restaurants.**

# Quarantine and Preshipment

## Estimated Global QPS Uses (2013)




Source: 2014 TEAP Assessment Report

# Summary of Clean Air Act Uses of MeBr

- Newly Produced
  - Critical Uses (2015 and 2016 only)
    - CA Strawberries
    - Country Ham
  - Quarantine and Preshipment Uses (no expiration)
- Carryover CUE Material
  - Produced under a CUE but not used in a given control period
  - If produced for pre-plant CUEs:
    - Only CA Strawberries through the end of 2016
    - Any remaining must be destroyed after 2016
  - If produced for post-harvest CUEs:
    - Only Country Ham
    - No expiration, no destruction requirement

# Summary of Clean Air Act Uses of MeBr

- Stocks
  - Produced prior to the 2005 phaseout
  - 158 MT remaining as of January 1, 2015
  - If mixed with pic:
    - CA Strawberries through the end of 2016
    - Any remaining after 2016 can be used for soil QPS uses
  - If not mixed with pic:
    - CA Strawberries through the end of 2016
    - Country Ham
    - Other labeled post-harvest uses
    - QPS uses

# QPS Regulatory Requirements

- Distributors
  - May only sell QPS MeBr for QPS applications.
  - *Recordkeeping*
    - Must collect certifications from applicators or end users prior to delivery of the gas.
    - The certifications must state that the QPS methyl bromide will be used solely for quarantine or preshipment applications.
    - Distributors must maintain those certifications for three years.
  - *Reporting:*
    - Must report quarterly the total amount sold to applicators or end users.

# QPS Regulatory Requirements

- Third-Party Applicators
  - May only apply QPS MeBr for QPS applications.
  - *Recordkeeping*
    - The applicator must certify to the distributor when they purchase the gas that it will only be used for QPS applications.
    - The applicator must maintain, for every application, a document from the commodity owner, shipper, or their agent citing the regulatory requirement that justifies the QPS use. Applicators must maintain those documents for three years.

# Additional Information

- EPA websites
  - http://www.epa.gov/ozone/mbr/
  - http://www.epa.gov/oppsrrd1/reregistration/methyl_bromide/
- UNEP Data Access Centre
  - http://ozone.unep.org/en/ods_data_access_centre/
- 2014 MBTOC Assessment Report
  - http://ozone.unep.org/en/Assessment_Panels/TEAP/Reports/MBTOC/MBTOC-Assessment-Report-2014.pdf
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