Advanced Calpuff Workshop

Calpuff – '2D Mode':
Consistency with Ausplume

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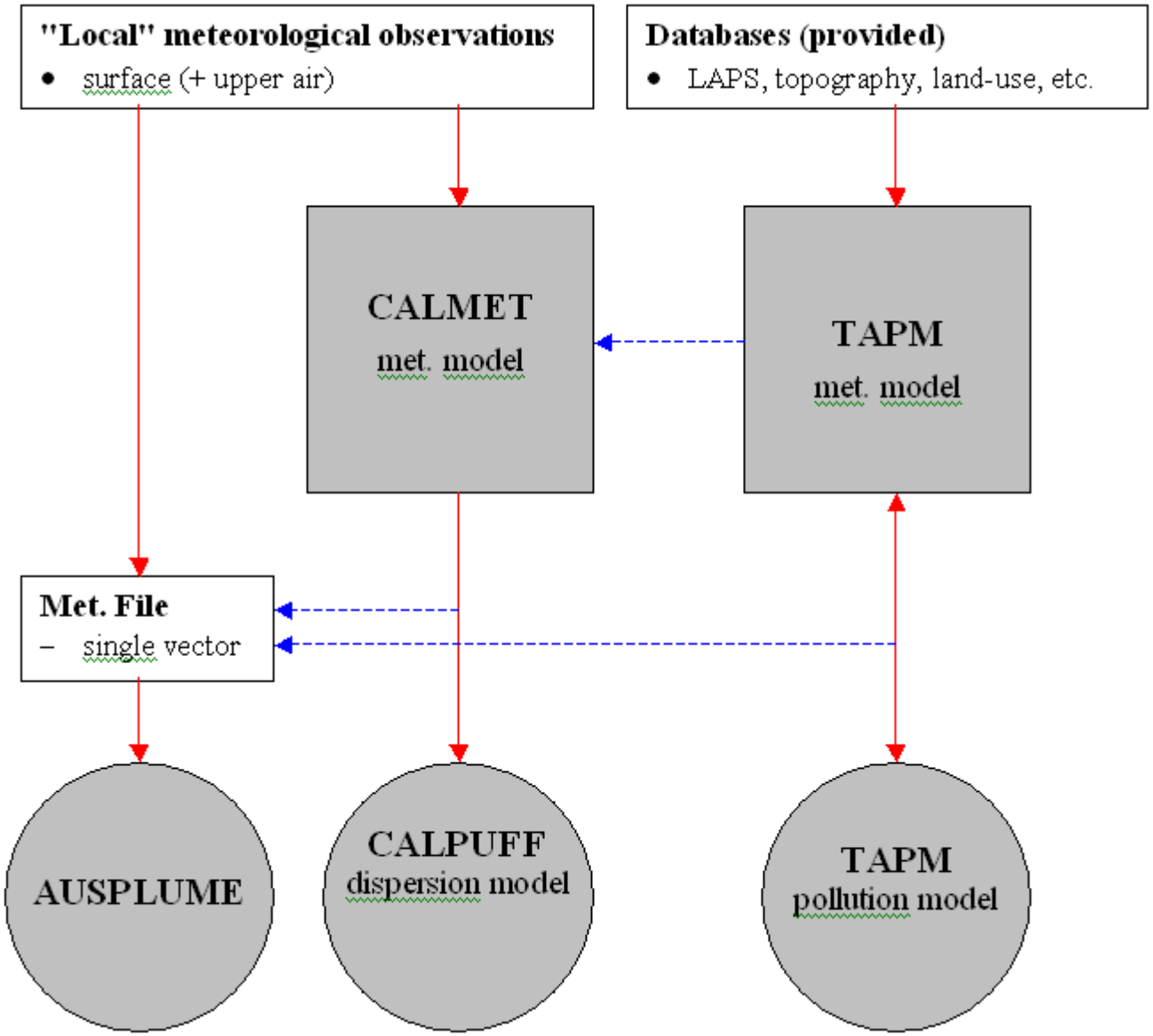
Complementary Approach



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Introductory remarks/assumptions

- Ausplume will continue to play a key role in regulatory impact assessment modelling

- Calpuff in a '2D mode' has potential advantages cf. Ausplume, particularly when 'plume history' is important

- However, guidance is needed to ensure consistency with Ausplume

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Key factors to consider

Dispersion Schemes

Ausplume:

- PG dispersion for stack heights less than 100m
- Briggs/MP dispersion for stack heights greater than 100m
- Dispersion curves regarded as 3-minute averages
- 'Rural' or 'Urban' only relevant to wind profile exponents, not dispersion
- Sigma-theta scheme the preferred option

Calpuff:

- 'Rural' - PG dispersion
- 'Urban' - Briggs/MP dispersion
- Dispersion curves regarded as 1-hour averages
- Sigma-theta and other schemes available

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Example 1

- Stack source – 50m, no plume rise
- Constant met conditions – Stability D, 7.2 m/sec
- **Ausplume:**
  - Averaging time: 1 hour
  - Dispersion: PG + zo adjustments (zo=0.4)
  - Wind profile exponent: Irwin rural
- **Calpuff:**
  - tave=60 min + tpg=3 min
  - PG coef (Rural, ISC curves + MP coef (Urban) + zo adjustment
  - Land use type=other; zo=0.4; dispersion regime: Rural
  - Wind profile exponent: ISC Rural

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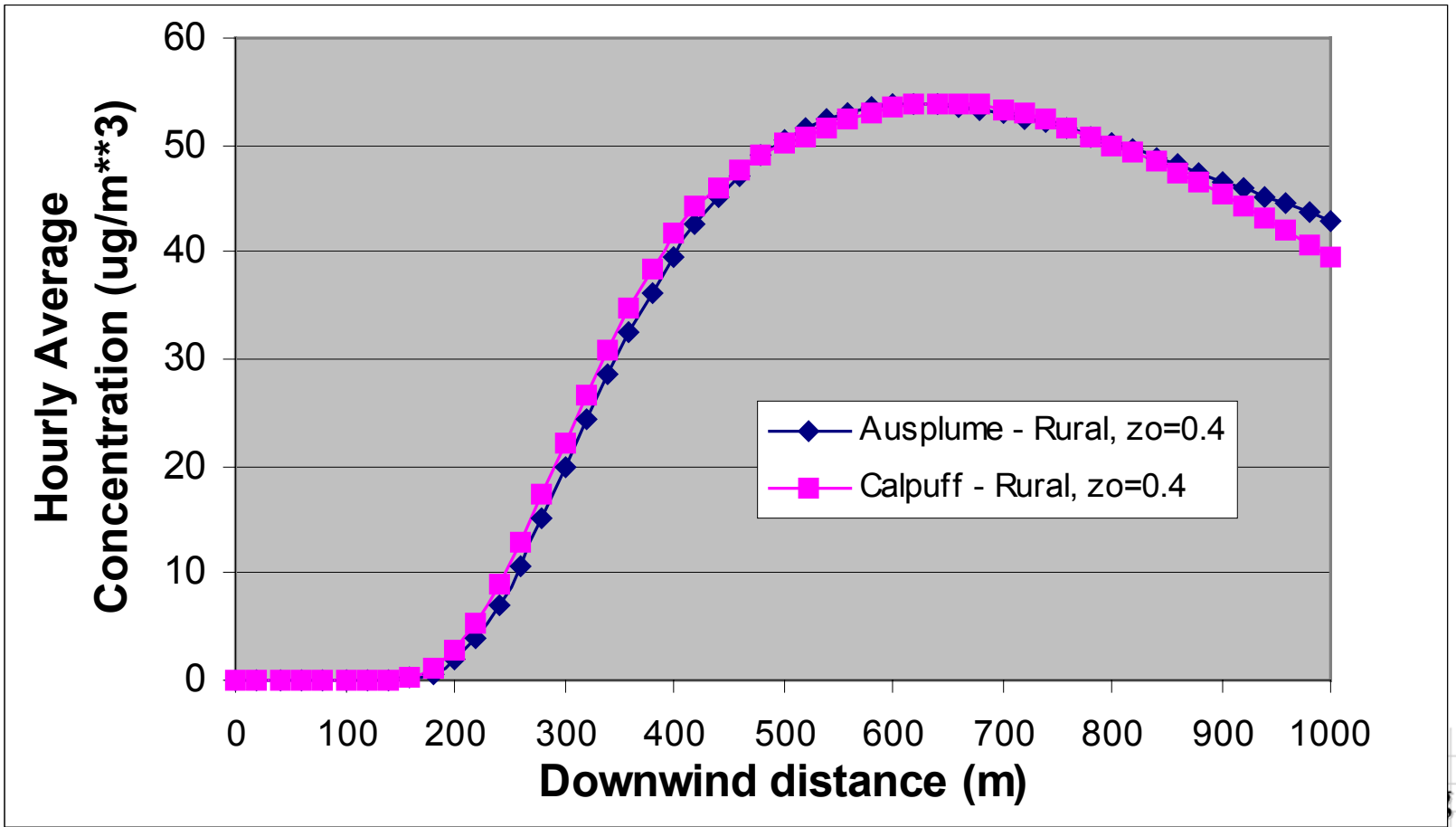
Example 1



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Example 2

- Stack source – 50m, no plume rise
- Constant met conditions – Stability D, 7.2 m/sec
- **Ausplume:**
  - Averaging time: 1 hour
  - Dispersion: PG + zo adjustments (zo=1.0)
  - Wind profile exponent: Irwin urban
- **Calpuff:**
  - tave=60 min + tpg=3 min
  - PG coef (Rural, ISC curves + MP coef (Urban) + zo adjustment
  - Land use type=other; zo=1.0; dispersion regime: Urban
  - Wind profile exponent: ISC Urban-2

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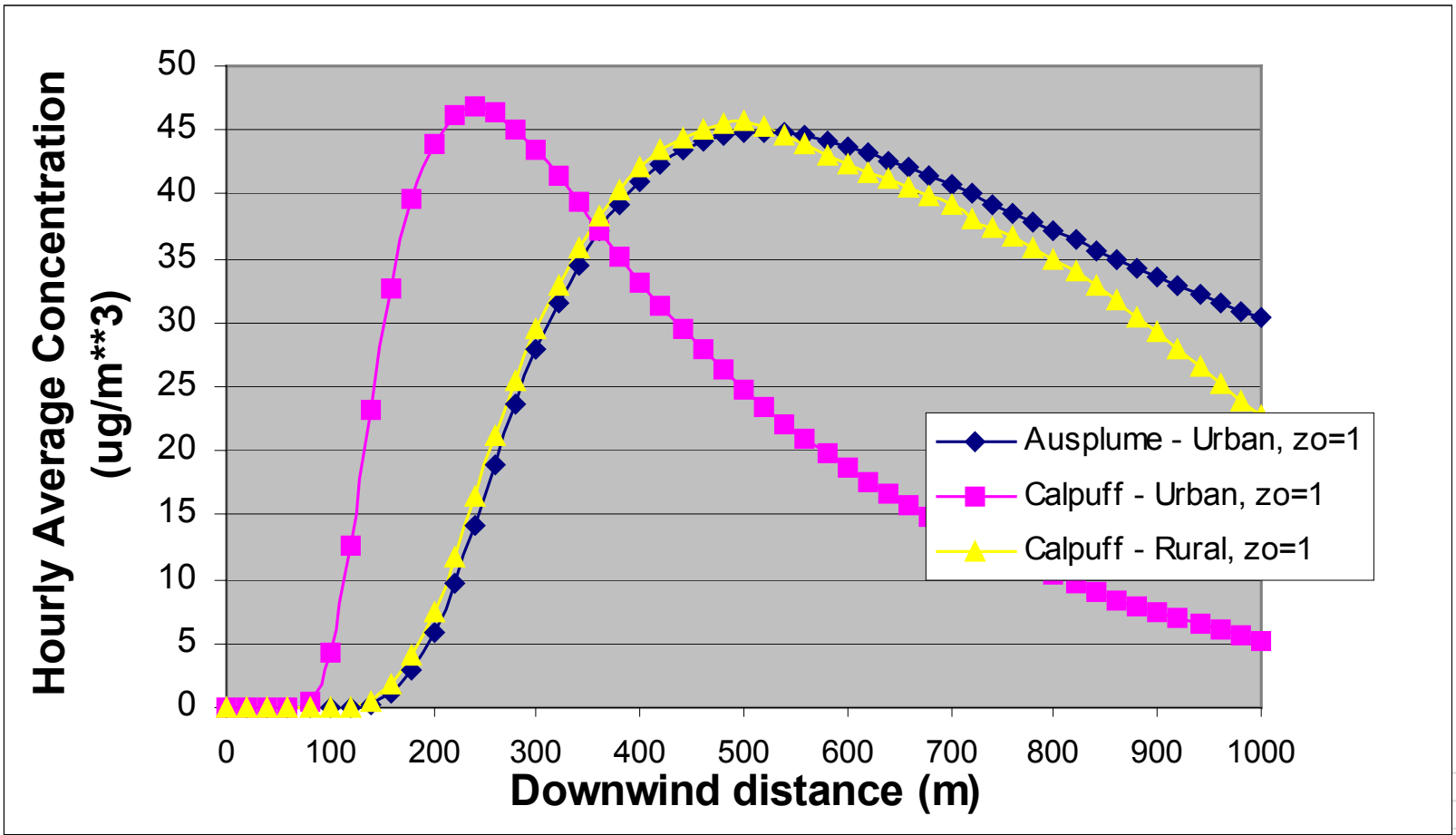
Example 2



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Recommendations

- Maintain current ability to interpret PG and MP curves as 3-minute averages in Calpuff (even if set or imbedded as an ‘advanced or non-standard’ option)
- Develop a CASANZ/ModSIG guidance document which includes guidance on how to ensure consistency between Calpuff and Ausplume

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