



*Supplement of*

## **Pliocene Model Intercomparison (PlioMIP) Phase 2: scientific objectives and experimental design**

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## Supplement 1: Core Experimental Design Sheets

### Pre-Industrial Experiment

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#### Model Coupling

Atmosphere-Ocean-Vegetation

#### Integration Length

At least 500 years

#### Oceans

Ocean Mode	Ocean Input
<i>Predicted</i>	<i>Local Pre-Industrial/Modern</i>

#### Geographic Boundary Conditions

Land/Sea Mask	Topography	Ice Sheets	Vegetation
<i>Local Modern</i>	<i>Local Modern</i>	<i>Local Modern</i>	<i>Pre-industrial then predicted or Pre-industrial prescribed</i>

#### Greenhouse Gases

CO <sub>2</sub>	N <sub>2</sub> O	CH <sub>4</sub>	CFCs	O <sub>3</sub>
<i>280 ppm</i>	<i>270 ppb</i>	<i>760 ppb</i>	<i>0</i>	<i>Local Modern</i>

#### Solar Constant

1365 W/m<sup>2</sup>

#### Aerosols

*Pre-industrial*

#### Model Spin-up

*Documented by individual groups*

#### Orbital Parameters

*[ecc = 0.016724] - [obl = 23.446°] - [peri - 180° = 102.04°]  
Date of vernal equinox March 21 at noon*

## Pliocene Experiment – Standard Boundary Conditions

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### Model Coupling

*Atmosphere-Ocean-Vegetation*

### Integration Length

*At least 500 years*

### Oceans

Ocean Mode	Deep Ocean Input			
<i>Predicted</i>	<i>Previously spun up Pliocene simulation or pre-industrial</i>			
Land/Sea Mask	Topography*	Ice Mask	Vegetation	
<i>Plio_sdt_LSM_v1.0.nc</i>	<i>Plio_sdt_topo_v1.0.nc</i>	<i>Plio_sdt_icemask_v1.0.nc</i>	<i>Dynamic or</i> <i>Plio_std_mbiome_v1.0.nc</i>	

### Greenhouse Gases

CO <sub>2</sub>	N <sub>2</sub> O	CH <sub>4</sub>	CFCs	O <sub>3</sub>
<i>400 ppm</i>	<i>As PI Control</i>	<i>As PI Control</i>	<i>As PI Control</i>	<i>As PI Control</i>

### Solar Constant

*As PI Control*

### Aerosols

*As PI Control*

### Model Spin-up

*Documented by individual groups*

### Orbital Parameters

*As PI Control*

\* Apply using anomaly method

## Pliocene Experiment – Enhanced Boundary Conditions

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### Model Coupling

*Atmosphere-Ocean-Vegetation*

### Integration Length

*At least 500 years*

### Oceans

Ocean Mode	Deep Ocean Input			
<i>Predicted</i>	<i>Previously spun up Pliocene simulation or pre-industrial</i>			
Land/Sea Mask	Topography*	Ice Mask	Vegetation	
<i>Plio_enh_LSM_v1.0.nc</i>	<i>Plio_enh_topo_v1.0.nc</i>	<i>Plio_enh_icemask_v1.0.nc</i>	<i>Dynamic or</i> <i>Plio_enh_mbiome_v1.0.nc</i>	

### Greenhouse Gases

CO <sub>2</sub>	N <sub>2</sub> O	CH <sub>4</sub>	CFCs	O <sub>3</sub>
<i>400 ppm</i>	<i>As PI Control</i>	<i>As PI Control</i>	<i>As PI Control</i>	<i>As PI Control</i>

### Solar Constant

*As PI Control*

### Aerosols

*As PI Control*

### Model Spin-up

*Documented by individual groups*

### Orbital Parameters

*As PI Control*

\* Apply using anomaly method.