

**Radiocarbon dates constrain the timing of environmental and cultural shifts in the
Holocene strata of Wonderwerk Cave, South Africa**

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Supplementary information: Model code from the OxCal model.

```
Plot()
{
  Outlier_Model("General",T(5),U(0,4),"t");
  Curve="ShCal13.14c";
  Sequence()
  {
    Boundary("Start 5a");
    Phase("5a")
    {
      R_Date("6884", 10080, 100)
      {
        Outlier(0.05);
      };
      R_Date("2852", 9760, 120)
      {
        Outlier(0.05);
      };
      Date("Date 5a");
    };
    Boundary("End 5a");
    Boundary("Start 4d");
    Phase("Phase 4d")
    {
      R_Date("2546", 9130, 90)
      {
        Outlier(0.05);
      };
      R_Date("2786", 10200, 90)
      {
        Outlier(0.05);
      };
    };
  };
}
```

```
};  
R_Date("2790", 10000, 70)  
{  
  Outlier(0.05);  
};  
R_Date("6872", 10120, 120)  
{  
  Outlier(0.05);  
};  
R_Date("6871", 10120, 100)  
{  
  Outlier(0.05);  
};  
Date("Date 4d");  
};  
Boundary("End 4d");  
Boundary("Start 4c");  
Phase("4c")  
{  
  R_Date("2545", 5970, 70)  
  {  
    Outlier(0.05);  
  };  
  R_Date("2798", 7430, 60)  
  {  
    Outlier(0.05);  
  };  
  R_Date("31897", 5063, 30)  
  {  
    Outlier(0.05);  
  };  
  Date("Date 4c");  
};  
Boundary("End 4c");  
Boundary("Start 4b");  
Phase("Phase 4b")  
{
```

```
R_Date("2544", 5180, 70)
{
  Outlier(0.05);
};
R_Date("30640", 5627, 33)
{
  Outlier(0.05);
};
R_Date("30641", 5771, 34)
{
  Outlier(0.05);
};
R_Date("30642", 5915, 34)
{
  Outlier(0.05);
};
Date("Date 4b");
};
Boundary("End 4b");
Boundary("Start 4aLH");
Phase("4aLH")
{
  R_Date("2797", 4890, 70)
  {
    Outlier(0.05);
  };
  R_Date("30638", 5340, 33)
  {
    Outlier(0.05);
  };
  R_Date("30639", 4887, 33)
  {
    Outlier(0.05);
  };
  Date("Date 4aLH");
};
Boundary("End 4aLH");
```

```
Boundary("Start 4a");
Phase("Phase 4a")
{
  R_Date("2541", 4240, 60)
  {
    Outlier(0.05);
  };
  R_Date("30566", 4459, 30)
  {
    Outlier(0.05);
  };
  R_Date("30567", 4427, 29)
  {
    Outlier(0.05);
  };
  R_Date("30568", 4207, 30)
  {
    Outlier(0.05);
  };
  Date("Date 4a");
};
Boundary("End 4a");
Boundary("Start 3");
Phase("Phase 3")
{
  R_Date("6873", 2120, 80)
  {
    Outlier(0.05);
  };
  R_Date("2542", 1890, 50)
  {
    Outlier(0.05);
  };
  R_Date("2543", 2910, 60)
  {
    Outlier(0.05);
  };
};
```

```

R_Date("2785", 3990, 60)
{
  Outlier(0.05);
};
Date("Date 3");
};
Boundary("End 3");
Boundary("Start 2b");
Phase("2b")
{
  R_Date("2779", 1210, 50)
  {
    Outlier(0.05);
  };
  Date("Date 2b");
};
Boundary("End 2b");
};
Difference("Hiatus 2b/3", "Start 2b", "End 3");
Difference("Hiatus 4a/3", "Start 3", "End 4a");
Difference("Hiatus 4aLH/4a", "Start 4a", "End 4aLH");
Difference("Hiatus 4aLH/4b", "Start 4aLH", "End 4b");
Difference("Hiatus 4c/4b", "Start 4b", "End 4c");
Difference("Hiatus 4c/4d", "Start 4c", "End 4d");
Difference("Hiatus 4d/5a", "Start 4d", "End 5a");
Difference("Phase 5a Duration", "End 5a", "Start 5a");
Difference("Phase 4d Duration", "End 4d", "Start 4d");
Difference("Phase 4c Duration", "End 4c", "Start 4c");
Difference("Phase 4b Duration", "End 4b", "Start 4b");
Difference("Phase 4aLH Duration", "End 4aLH", "Start 4aLH");
Difference("Phase 4a Duration", "End 4a", "Start 4a");
Difference("Phase 3 Duration", "End 3", "Start 3");
Difference("Phase 2b Duration", "End 2b", "Start 2b");
};

```