HOR/STOA master class

1. HW1 discussion

2. PW2 discussion

3. Manipulating vectors and matrices in R/Rstudio (Ben)

4. HW2

5. For Tuesday (5/7):
   - complete HW2
   - do PW3

need additional R/Rstudio help:
- copy + paste code into email to us
- debug line-by-line:
  - typos
  - case
- look a few lines up for bugs
- read error msgs carefully
- use str() function
"Large-scale" structure in space time in historical gridded datasets:

1. Auto-correlation (pattern extends over larger domain than grid resolution), with large amplitude

2. Persistence in time: feature observable over multiple time points
Covariance matrix: notation

If $C_{xy}$ is a covariance matrix with 4 rows and four columns:

<table>
<thead>
<tr>
<th>Column 1 (location 1)</th>
<th>Column 2 (location 2)</th>
<th>Column 3 (location 3)</th>
<th>Column 4 (location 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row 1 (location 1)</td>
<td>$C_{11}$</td>
<td>$C_{12}$</td>
<td>$C_{13}$</td>
</tr>
<tr>
<td>Row 2 (location 2)</td>
<td></td>
<td>$C_{22}$</td>
<td>$C_{23}$</td>
</tr>
<tr>
<td>Row 3 (location 3)</td>
<td></td>
<td></td>
<td>$C_{33}$</td>
</tr>
<tr>
<td>Row 4 (location 4)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What belongs here?

For instance: Wallongong, Sydney, Newcastle, Canberra.