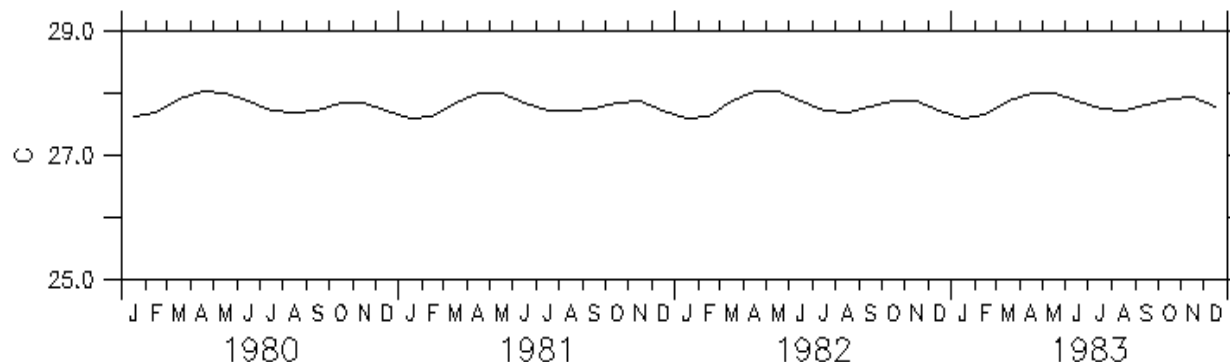LONGITUDE : 140E to 90W (XY ave)
LATITUDE : 15S to 15N (XY ave)
Z (LAYERS) . 0

DATA SET: p021001

Model Output
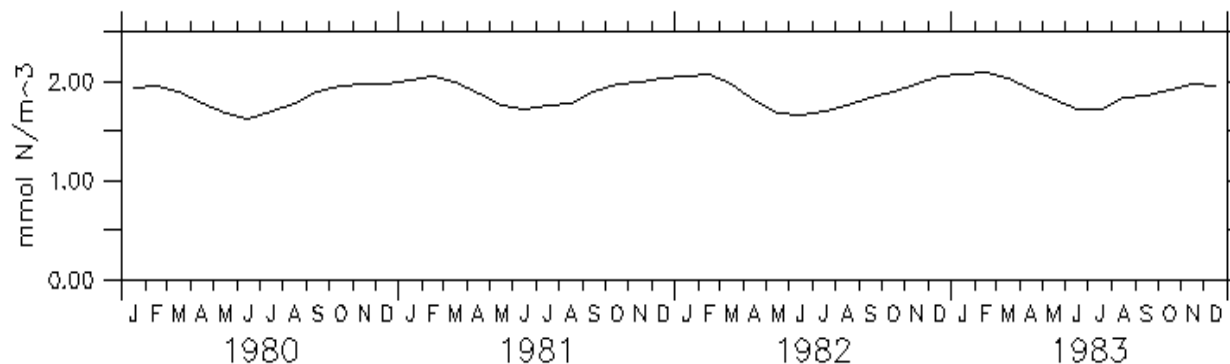

Temperature (C)

LONGITUDE : 140E to 90W (XY ave)
LATITUDE : 15S to 15N (XY ave)
Z (LAYERS) . 0

DATA SET: p021001

Model Output

Nitrate (mmol N/m^3)

<u>Two-sample pooled *t*-test for difference of means</u>

Why?   To compare two unknown means, μ_1 and μ_2.

When?   The following conditions must be present for the test to be accurate and valid. All of the conditions may have to be *assumed* to proceed with the test.
1. σ_1 and σ_2 are unknown but **assumed to be equal**.
2. The samples are selected independently.
3. The samples are from normally distributed populations.

How:

Preliminary: • Select the level of significance, α (use 0.05 unless otherwise stated).
                 • Define μ_1 and μ_2 in the context of the problem.

1. State the null hypothesis:

$$H_0: \ \mu_1 = \mu_2$$

2. Calculate the test statistic:
(1) First find the pooled standard deviation:

$$s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}}$$

(2) Calculate the test statistic:

$$t_0 = \frac{\left(\bar{x}_1 - \bar{x}_2\right)}{s_p\sqrt{\left(\dfrac{1}{n_1} + \dfrac{1}{n_2}\right)}}$$

3. Find the *P*-value (observed significance level): using a *t* distribution with $n_1 + n_2 - 2$ degrees of freedom.

4. Conclusion: Reject H_0 if the *P*-value is less than the level of significance; otherwise, do not reject H_0.