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The response of different terresterial parameters after zeroing out noncondensing greenhouse gases.

```
clear all
close all
lat = ncread('data/noGHG_250m.atmos.nc','lat');
tsurf = ncread('data/noGHG_250m.atmos.nc','t_surf');
cwvp = ncread('data/noGHG_250m.atmos.nc','WVP');
swdn_toa = ncread('data/noGHG_250m.atmos.nc','swdn_toa');
swup_toa = ncread('data/noGHG_250m.atmos.nc','swup_toa');
cldcvr = ncread('data/noGHG_250m.atmos.nc','tot_cld_amt');
netrad_toa = ncread('data/noGHG_250m.atmos.nc','netrad_toa');
icecvr = ncread('data/noGHG_250m.ice.nc','ice_cover');
ylat = ncread('data/noGHG_250m.ice.nc','yt');

tsurf_ann=squeeze(mean(reshape(tsurf,[90 12 400]),2));
cwvp_ann = squeeze(mean(reshape(cwvp,[90 12 400]),2));
swdn_toa_mn = squeeze(mean(reshape(swdn_toa,[90 12 400]),2));
swup_toa_mn = squeeze(mean(reshape(swup_toa,[90 12 400]),2));
cldcvr_mn = squeeze(mean(reshape(cldcvr,[90 12 400]),2));
netrad_toa_mn = squeeze(mean(reshape(netrad_toa,[90 12 400]),2));
icecvr_mn = squeeze(mean(reshape(icecvr,[90 12 400]),2));

tsurf_ann_cel = tsurf_ann-273.15;
plan_alb = swup_toa_mn./swdn_toa_mn;
initial_cwvp = 32.02;
cwvp_ann_calc = cwvp_ann./initial_cwvp;

tsurf_ann_gm = zeros(1,400);
cwvp_ann_in = zeros(1,400);
plan_alb_tri = zeros(1,400);
cldcvr_mn_tri = zeros(1,400);
netrad_toa_mn_tri = zeros(1,400);
icecvr_mn_tri = zeros(1,400);

for t=1:size(tsurf_ann_cel,2)
        tsurf_ann_gm(t)=sum(cos(lat*pi/180).*tsurf_ann_cel(:,t))/
sum(cos(lat*pi/180));
        cwvp_ann_in(t) =
 sum(cos(lat*pi/180).*cwvp_ann_calc(:,t)).*100/sum(cos(lat*pi/180));
        plan_alb_tri(t)= sum(cos(lat*pi/180).*plan_alb(:,t)).*100/
sum(cos(lat*pi/180));
        cldcvr_mn_tri(t)= sum(cos(lat*pi/180).*cldcvr_mn(:,t))./
sum(cos(lat*pi/180));
        netrad_toa_mn_tri(t) =
 sum(cos(lat*pi/180).*netrad_toa_mn(:,t))./sum(cos(lat*pi/180));
        icecvr_mn_tri(t) = sum(cos(ylat*pi/180).*icecvr_mn(:,t)).*100/
sum(cos(ylat*pi/180));
end
tsurf_ann_gm_sub = tsurf_ann_gm(:,[1:200]);
cwvp_ann_in_sub = cwvp_ann_in(:,[1:200]);
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plan_alb_tri_sub = plan_alb_tri(:,[1:200]);
cldcvr_mn_tri_sub = cldcvr_mn_tri(:,[1:200]);
netrad_toa_mn_tri_sub = netrad_toa_mn_tri(:,[1:200]);
icecvr_mn_tri_sub = icecvr_mn_tri(:,[1:200]);
year = [1:1:200];

yyaxis left;
plot (year,tsurf_ann_gm_sub,'k','LineWidth',2);
axis ([0 200 -50 20 ]);
set (gca, 'YLim',[-50 20],'ycolor','k');
set (gca,'YTick',(-50:10:20));
set(gca,'XMinorTick','on');
set(gca,'YMinorTick','on');
ylabel('Surface Temperature (^{\circ}C)','color','k','FontSize',15);
xlabel('Year','color','k','FontSize',15);
text(50,-26,'Surface Temperature (^{\circ}C) \uparrow');

hold on
yyaxis right
ylabel('Per Cent Change','color','k','FontSize',15);
set (gca, 'YLim',[0 100],'ycolor','k');
set (gca,'YTick',(0:20:100));
set(gca,'YMinorTick','on');
plot (year, cwvp_ann_in_sub,'color',[139 203 218]./255,'LineWidth',2);
text(50,15,'\downarrow Column Water Vapor (%)');

hold on
yyaxis right
plot(year, plan_alb_tri_sub,'color',[225 132 68]./255,'LineWidth',2);
hline = findobj(gcf, 'type', 'line');
set(hline(1),'LineStyle','-');
text(130,48,'\uparrow Planetary Albedo (%)');

hold on
yyaxis right
plot(year, cldcvr_mn_tri_sub,'color',[167 200
 103]./255,'LineWidth',2);
hline = findobj(gcf, 'type', 'line');
set(hline(1),'LineStyle','-');
text(32,83,' \uparrow Cloud Cover (%)');

hold on
yyaxis left
plot(year, netrad_toa_mn_tri_sub,'k','LineWidth',2);
text(40,-3,' TOA Net Flux (W/m^2) \downarrow');

hold on
yyaxis right;
plot (year,icecvr_mn_tri_sub,'r','LineWidth',2);
hline = findobj(gcf, 'type', 'line');
set(hline(1),'LineStyle','-');
text(94,80,'Sea Ice Cover (%) \rightarrow');
title('Global Annual Mean Change');
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